December 2011

Determining the Feasibility of a Shared Collections Facility

Aileen Caceres
Worcester Polytechnic Institute

Christa Colleen Coscia
Worcester Polytechnic Institute

Christopher Michael Surprenant
Worcester Polytechnic Institute

Determining the Feasibility of a Shared Collections Facility

An Interactive Qualifying Report submitted to faculty of
Worcester Polytechnic Institute
in partial requirements for the Degree of Bachelor of Science.

By: Aileen Caceres, Christa Coscia, and Christopher Surprenant

Dated: December 15, 2011

Submitted to:
Dr. Janet Schulte
Sponsor Liaison
Maria Mitchell Association

Nantucket Project Center

Dr. Dominic Golding
Project Advisor
Worcester Polytechnic Institute

Abstract

The goal of this study was to determine the feasibility of developing a collaborative collections storage facility for several museums and other non-profit organizations on Nantucket. Through extensive interviews, site visits, and other background research, we found there is an urgent need for climate-controlled, collections storage space. The team concluded that building a new facility under collective management was the preferred option.

Acknowledgements

Our team would like to thank our sponsor, the Maria Mitchell Association, as well as our liaison Dr. Janet Schulte for supporting us and our project throughout the term. We greatly appreciate the input and participation from Molly Anderson, Julia Blyth, Debbie Dilworth, Jascin Finger, Robert Frazier, Jean Grimmer, Cecil Jensen, Jim Lentowski, Andrew McKenna-Foster, Bill Oliver, Renee Oliver, Sarah Parks, Era Sylvia, Lincoln Thurber, Andrew Vorce and Maryann Wasik. Their willingness to take time out of their days to attend weekly meetings and provide us with tours of their current facilities allowed us to develop the necessary information to produce a comprehensive study. Lastly, we would like to thank our professor Dr. Dominic Golding for his guidance during our project and helping us construct this report.

Executive Summary

From their inception as simple "halls of curiosities", where collection of artifacts were kept in the homes of the wealthy, to the centers of learning they became as a product of the academic change brought by the Enlightenment, museums have always played an important role in society (The British Museums, 2003). Much of their importance stems from the invaluable and irreplaceable objects that make up museum collections. Regrettably, many museum collections are improperly stored and maintained, and are therefore increasingly susceptible to irreparable damage. This is demonstrated in the survey conducted by the heritage Preservation organization, which concluded that in 59% of institutions in the United States with collections, the collections have suffered damage from light due to inadequate storage environments (2005). Improper storage and maintenance is most often due to a lack of space, money, and staff. This is particularly the case among small museums, such as those on Nantucket, that have especially limited resources but unique collections that reflect local history and culture. The Nantucket museums and other cultural institutions are aware of their community responsibilities to preserve and protect the artifacts they possess for future generations, but they are also keenly aware that they do not have the resources necessary to assure the proper care and storage of diverse artifacts, ranging from archival documents and photographs to plant and animal specimens. In order to ensure the proper care and storage of these objects, the institutions on Nantucket are interested in exploring the possibility of developing a shared collections facility where, through collaboration and combination of resources, items in their collections can be adequately stored and maintained.

Project Goal and Objectives

The goal of this project was to determine the feasibility of developing a shared collections facility for museums, town departments, and other institutions on Nantucket. In order to accomplish this goal, the project team completed five major objectives.

Before determining the feasibility of developing a shared collections facility on Nantucket, the team first identified which institutions were willing to participate and their level of interest. The team contacted appropriate representatives from the Maria Mitchell Association, the Nantucket Historical Association, the Nantucket Lightship Basket Museum, the Egan Maritime Institute, the African Meeting House, the Atheneum, the Artist's Association of Nantucket, and the Nantucket Conservation Foundation.

Having identified the participating institutions, we conducted a needs assessment through interviews with appropriate staff and supplemental 'walkthrough' site visits of their facilities and their collections storage areas, both on and off-site as appropriate. In addition to the interviews and the 'walkthrough' site visits, the project team also held a weekly meeting with representatives from each institution to discuss ongoing research and preliminary findings. Determining the size, nature, and condition of the current collections at the participating institutions was critical to the success of this project; this information was obtained by conducting inventories of the collections at each institution (as shown below).

Space Needs by Organization

Organization	Nature of collection	Space needed (sq. ft.)
African Meeting House	Books, manuscripts, paper records, furniture, gramophone records	600
Artist's Association	Paintings, sculptures	800
Atheneum	Books, newspapers, manuscripts	1,200
Egan Maritime Institute	Paintings, lifesaving equipment, paper records	800
Lightship Basket Museum	Baskets, paper records	600
Maria Mitchell Association	Books, natural science specimens, manuscripts	2,300
Total:		6,300

To determine which would be the most advantageous location for this facility, the project team evaluated the specifications of both modifying an existing building to suit the organizations' needs and constructing a new building for this project's purpose. The team also identified how the space was apportioned for different uses and what this meant in terms of the amount of space available for different types of storage based on the climate and other conditions. The project team worked up a rough estimate of the size and type of building necessary to accommodate the various collections, and based on this developed some very rough cost estimates.

Conclusions and Recommendations

Based upon the interviews conducted and the supplemental 'walkthrough' site visits, the project team concluded that there is a definite need for this facility on Nantucket. Currently the priceless and irreplaceable artifacts housed by the participating institutions are in great risk of deterioration due to the improper conditions in which they are kept. The facility would provide the proper climate control and storage areas necessary to preserve the valuable objects for future generations. The organizations involved are small in size and therefore do not have the finances or space to create a climate controlled area for their collections individually but, through a collaborative effort such as the proposed facility, the pooling of resources could ensure a safe and proper environment for the historic objects in their care. The existing storage areas are not equipped well enough to guarantee the survival of pieces through which Nantucket culture and heritage are kept alive, and therefore the project team highly recommends that there be continued research and planning for this facility.

The project team recommends that the participants strongly consider building a new structure to be used as the proposed facility. While the topic of an existing building versus a new building was initially discussed in interviews and meetings, it was determined that there are no existing structures that would meet the needs of the organizations. Not only would the existing building have to be of appropriate size, but it would also have to meet the appropriate zoning requirements. Taking these factors into consideration, it would be very difficult for the participants to find an existing structure that would be suitable. While retro-fitting a building might be appealing at first from a financial standpoint, in the long run it will most likely be more costly. An existing building would require working with what is already there or completely redoing the inside of the building. Installing all the proper equipment could also be problematic. With the information gathered from several professionals, the project team concludes that it is in the participants' best interest to construct a new building.

Due to its small size, land is a scarce commodity on Nantucket Island. After learning from Andrew Vorce, Director of Planning, that this facility would likely need to be located in an area zoned for industrial purposes, we concluded that there are very limited parcels of land that would be suitable. Of the land suitable for this facility, much of it is located by the Nantucket Memorial Airport and it is recommended that the facility be placed there. Unfortunately, in the industrial district, each 5,000 square foot lot costs about $450,000-$600,000, and given set-

backs, a parcel of approximately 22,000 square feet would be required at an approximate cost of $2.0-2.6 million.

From the interviews and weekly meetings with participants, the project team was able to determine that a work/research space is needed. While not every institution would need an area for work/research use, the majority felt it would be a good addition and ultimately add to the safety of the collections. For example, if the participants have to go to the facility and take a piece from their collection back to their museum for it to be worked on and/or researched, this unnecessary transport could incur damage to the object. Since the goal of the facility is to protect the various collections from damage, not having a work space seems to be counterproductive if the participants feel it would be properly utilized. For these reasons, the project team feels that it would be most beneficial to have three work/research spaces. The rooms could be separated into archival, paintings, and natural science collection use. These three broad categories would cover all the bases and would allow the collections to be worked on as well as prevent contamination.

Construction Costs of Different Configuration Options

Configuration	Size (sq. ft.)	Cost
Storage	6,900	$3,600,000
Storage with necessities (bathroom & mechanical room)	7,100	$3,700,000
Storage with receiving room	7,400	$3,800,000
Storage with 1 work space	7,200	$3,800,000
Storage with 2 work spaces	7,500	$3,900,000
Storage with 3 work spaces	7,800	$4,000,000
Storage with 3 work spaces, a receiving room, and necessities	8,500	$4,400,000

Based upon the rough construction cost estimates, the project team concludes that the construction costs directly depend on the configuration of the building. Depending on which configuration the participants choose it is going to directly affect the construction costs and operating costs. If the configuration with just storage space is chosen, the construction costs are obviously going to be lower than if the configuration with storage space, a receiving room, and

work rooms is chosen. The project team recommends that the participants choose the option that includes, a storage space, a receiving room, and work rooms because although the most expensive option, it will allow them to not only store but maintain their collections all in one place. Annual utilities (i.e. primarily HVAC) would cost approximately $48,000. Additional operating costs would include the costs of security and staffing (including management oversight), but these costs would vary based on the management model and security arrangements chosen and we have not tried to estimate them here. A multiple floor facility is an important option for the participants to consider as a way to cut costs. The project team recommends that the participants consult with architects and developers to determine the most efficient and economical way to lay out the facility.

Summary of Costs (1 story facility)

Capital Costs	
Construction (11,000 ft^2 building)	$4.4 million
Land (in industrial zone)	$ 2.0 - 2.6 million
Equipment (HVAC, storage, fire suppression)	-
Operating Costs	
Utilities (primarily HVAC)	$48,000 per year
Staffing (including management oversight)	-
Security	-

Based on the conditions witnessed during the ‘walkthrough’ site visits the project team concludes that the proper equipment is not always being used thus endangering the lifespan of the collections. As a way to ensure the safety of their collections, the project team recommends that the participants closely look into the proper storage equipment as well as climate control systems. The proper equipment used for storage is essential for the survival of the collections as it protects them from light, contaminants, and pests and in order to determine which one would be most appropriate for the facility the participants should investigate more thoroughly. The project team also recommends that the participating organizations seek the aid of a professional regarding the proper installation and use of an HVAC system that will provide the best climate control available for the collections.

The high cost of land and building on the island coupled with outfitting the facility with efficient HVAC and fire suppression systems as well as museum quality storage compartments ensures that the facility, though necessary, may become a costly venture for the participating

organizations. The project team recommends looking into possible sources of funding and grants to financially aid the organizations. Grants could be gained through a variety of sources including the Institute of Museum and Library Services (IMLS) and the National Endowment for the Humanities (NEH), which is "an independent grant-making agency of the United States government dedicated to supporting research, education, preservation, and public programs in the humanities" (National Endowment for the Humanities [NEH], 2011). The NEH gives preservation assistant grants which "help small and mid-sized institutions—such as libraries, [and] museums…-improve their ability to preserve and care for their significant humanities collections" (NEH, 2011). Grant giving institutions might be more inclined to fund this type of facility if the participants consider the benefits of multi-purposing the site and/or making it a green facility. As advised by Elizabeth Wylie, the director of business development at Finegold, Alexander, and Associates Inc., the addition of housing for staff members to address the shortage of affordable living on the island to the facility may make more grants available. More grants may also be accessible if 'green' options are chosen, although these options often raise the initial capital costs. Apart from grants, it is recommended that the participating institutions also look into gaining funds by renting out space to private parties such as local art collectors that need a safe area to store their art. Another option that may be economically advantageous for the organizations to make is to develop a lease to own contract with a developer. This would reduce the initial costs of the facility and allow the organizations to move on with the plans for the facility with fewer funds raised.

After speaking with William Dunlap, the executive director of the New Hampshire Historical Society, about his experience participating in a similar feasibility study and discussing the topic of management during weekly meetings, the project team concluded that there are various options for the management of this facility. The team recommends that the participating institutions discuss their opinions about each option in order to determine which one would best fit their needs. The team believes that, of the possibilities presented, the most suitable options for the organizations on Nantucket would be to create a committee of representatives from each institution and allow them to vote and/or volunteer for responsibilities or to allow the responsibilities of managing the facility to rotate yearly between the organizations. Developing the committee would be similar to a system already in place between many of the participating institutions and may therefore be the easiest to implement on this facility. It would also allow the

management to further the collaboration occurring through the planning and use of this facility. Allowing one institution to manage the facility each year would decrease the chance of any miscommunication preventing all responsibilities from being fulfilled and could simplify the management of the facility.

Authorship

The research for our report was shared equally by all three members of the group. Aileen Caceres led the writing of the report as well as formatting. Christa Coscia heavily contributed to the writing and edited every draft. The interviews were led by Christa Coscia and notes were taken by Aileen Caceres and Christopher Surprenant. All three group members took turns leading weekly meetings and documenting the discussions that took place.

Table of Contents

List of Figures

List of Tables

Introduction

From their inception as simple "halls of curiosities", where collections of artifacts were kept in the homes of the wealthy, to the centers of learning they became as a product of the academic change brought by the Enlightenment, museums have always played an important role in society (The British Museum, 2003). Much of their importance stems from the invaluable and irreplaceable objects that make up museum collections. At any given time, however, most museums display less than 2% of their collections and the majority of the artifacts are put away in storage. Periodically, exhibits are refreshed and new exhibits are created using other artifacts from the collection, but most of the artifacts in the collection remain accessible only to museum staff and specialist researchers. Regrettably, many museum collections are improperly stored and maintained, and are therefore increasingly susceptible to irreparable damage. This is demonstrated in the survey conducted by the Heritage Preservation organization, which concluded that 59% of collecting institutions in the United States have had their collections suffer damage from light and 53% have had their collections damaged by moisture due to inadequate environments where the collections were stored (2005).

Improper storage and maintenance is most often due to a lack of space, money, and staff. This is particularly the case among small museums, such as those on Nantucket, that have especially limited resources but unique collections that reflect local history and culture. The island of Nantucket has undergone enormous change, from days as the whaling capital of the world to tourist vacation destination. The museums and other local institutions are the repositories and caretakers of the many treasured objects that reflect this rich heritage. The Nantucket museums and other cultural institutions are aware of their community responsibilities to preserve and protect these artifacts for future generations, but they are also keenly aware that they do not have the resources necessary to assure the proper care and storage of diverse artifacts, ranging from archival documents and photographs to plant and animal specimens. In order to ensure the proper care and storage of these objects, the institutions on Nantucket are interested in exploring the possibility of a shared collections facility where, through collaboration and combination of resources, items in their collections can be adequately stored and maintained.

The goal of this project was to determine the feasibility of developing a shared collections facility for museums, town departments, and other institutions on Nantucket. In order

to accomplish this goal, the project had five objectives. The project team has: identified institutions that may wish to join the collaborative venture; conducted a needs assessment to determine the nature, size, and management procedures for the proposed facility; clarified the standards for collections storage and maintenance to better understand the specifications that the storage facility will need to meet; evaluated space options available; and developed a set of recommendations for the implementation of this type of facility.

Literature Review

Background

According to the American Association of Museums, it is estimated that about 850 million people visit museums in the United States per year (American Association of Museum, 2009). These museums play a very important role in educating as well as entertaining its visitors with powerful and stimulating exhibits. While these exhibits are the primary reason people go to museums, what most people do not know is that only a very small portion of a museum's collections are on display at a time. At the Smithsonian, for example, less than two percent of their collections are out on display to the public at any given time and the approximately ninety-eight percent are put away in storage (Smithsonian, 2010). For this reason, exhibits are always changing and being updated to maintain the interest of the public and expose them to a variety of information the museum has to offer from their collections.

Unfortunately, many of these collections are at serious risk. For example, Heritage Preservation, a nonprofit organization dedicated to preserving our nation's heritage, noted that "65% of our nation's collecting institutions have experienced damage to collections due to improper storage" (Heritage Preservation, 2005). Collections damage is a serious problem that if not addressed could destroy some invaluable artifacts that society will never be able to retrieve. For example, a hot water pipe broke at the New Mexico Museum of Indian Arts and Culture in Santa Fe, New Mexico in 2004, as shown in Figure 1.

Approximately 1,400 storage boxes were immersed in water for over twenty four hours and many of the artifacts were unsalvageable (Heritage Preservation, 2005). Heritage Preservation also found that "59% of institutions have the majority of their collections stored in areas too small to accommodate them safely and appropriately" (Heritage Preservation, 2005). If these perilous conditions are not addressed, more and more collections risk being damaged and irreplaceable items may be lost forever. A report released by the Institute of Museum and Library Services (IMLS) explains, "Priceless pages from our national diary—from art objects to historical artifacts, from scrapbooks compiled over generations to modern digital collections—are imperiled by hazards such as time, flood, and fire. And, although the stories these treasures tell are timeless, the collections themselves are not" (IMLS, slide 2). Dr. Anne-Imelda M. Radice, former director of the IMLS, inveighs, "Sadly, once we lose these collections, we cannot

get them back—a possibility with profound impact for future generations of learners" (IMLS, slide 2).

Figure 1: Water Damage at the New Mexico Museum of Indian Arts and Culture in Santa Fe, New Mexico (Heritage Preservation, 2005)

While the larger, more famous museums, often located in major metropolitan centers, contain collections pertaining to different cultures and time periods from all over the world, smaller local museums have unique collections that reflect local history, events, interests, and conditions. These institutions are at a special risk because they are less able to store, manage, and maintain their collections in optimal conditions. Larger museums typically have more resources to maintain collections properly, with dedicated staff and appropriate storage facilities. Heritage Preservation explains, "Not every institution has the size or resources to have a professional conservator on staff…" (Heritage Preservation, 2005). Heritage Preservation goes on to note, even at larger institutions, "…when funds are scarce, too many institutions defer collections maintenance and leave future generations to suffer the consequences" (Heritage Preservation, 2005). Unfortunately, when a lack of funds becomes a problem, institutions have no choice but to make sacrifices that in the long run could end up damaging their collections. In order to address this problem, first it is essential to establish why collections are so important.

Why Are Collections Important?

At first, museums were primarily private collections shared only amongst the wealthy community. During the Enlightenment, museums started to open their doors to the public who were curious about the world around them. Subsequently, museums typically espoused four primary goals: acquisition, conservation, research and education (Moore, 94, p. 32). Museums are always trying to acquire the most interesting pieces to complete or complement their collections, and acquisition and conservation of the pieces in their collections are ongoing and never truly finished. Collections have substantive intrinsic value but they are also central to the functioning of museums. Museums are able to function the way they do because of collections. The Field Museum in Chicago, IL reports that, "The collections provide the foundation of the Museum's exhibition, research, conservation and education programs" (The Field Museum, 2011). New exhibits are created using items from existing collections in order to attract visitors to museums while bringing in money for the museum. Similarly, old exhibits are refreshed using collection items for the same reason. In addition to exhibits, collections are used by scientists and historians in various forms of research in all fields from science to art to history. The Natural History Museum in London explains that the majority of their collections are, "…held behind the scenes [and] form the basis of research projects carried out by the Museum's 300 scientists and numerous visiting scientists and researchers from all over the world" (Natural History Museum, 2011). Educational programs, utilized by the young and old alike, can also be created using the selected items from across the entire collection. The various uses and applications of collections are endless.

National Significance

While it may not seem readily apparent, the loss of collections could severely impact many facets of society. For example, people probably would not expect to find any connection between museum collections and public health and safety; however collections are actually vital in the role of helping to advance our knowledge of the health and safety of the public around the world. Collections can help identify the specific factors that caused an epidemic in the past and teach us how to respond to a new epidemic situation. By having collections to reflect on and understand past events, lives that would have potentially been at risk can be saved (The Society for the Preservation of Natural History Collections [SPNHC] 2010, para. 5). Collections have also been used to study infectious diseases and their causes. Often times, specimens of viruses or

bacteria that may have caused a disease in the past are stored in collections. In a journal article written by Andrew Suarez, Assistant Professor at the University of Illinois, and Neil Tsutsui, Assistant Professor at the University of California, they explain, "…researchers from the Centers for Disease Control and Prevention (CDC) compared isolates from the 2001 anthrax attack in the United States with stored specimens collected from the 1960's and 1970's to differentiate and identify the strain used" (2004). In this example, it can be easily seen how important stored collections can be in regards to saving human lives.

In addition to public health and safety, the ability of society to understand, monitor, and thus protect the environment would also be greatly impacted by the loss of collections. Some collections contain numerous samples of different types of soils, water, and air taken in the past. These samples provide a baseline of what the environment was like in a certain time period or under a certain condition. Samples that are collected from different times and conditions can help scientists to compare samples taken from today. Comparing data collected in the past with data collected today lets scientists understand why and how the environment has changed and allows them to predict what could happen in the future. Future environmental decisions could also be better handled by referencing past documented events and following either what did or did not work for past generations (SPNHC 2010, para. 3).

One of the major reasons to maintain collections is for their educational value. Art museums provide people with numerous types of artwork ranging from paintings, pastels, to sculptures. Science museums have extensive collections on countless subjects relating to biology, physics, chemistry, anatomy, and the environment. Natural history museums contain collections pertaining to the history of certain time periods or places. People can learn a never-ending amount of information from going to different types of museums (SPNHC 2010, para. 2).

On Nantucket

Nantucket, a small island only fourteen miles long and three and a half miles wide, is home to many small museums and institutions that regardless of their size house important collections that reflect the unique history, culture, economy, geography, and ecology of the island (Town and County of Nantucket Massachusetts, n.d.).

Each museum and institution addresses different aspects of island life. For example, the Maria Mitchell Association "provides scientific resources and educational programs for the community, uses Nantucket Island as an exceptional natural laboratory in which to study science

and the environment, and maintains research and/or representative collections of Nantucket's biodiversity" (Maria Mitchell Association, 2011). The MMA's collections, exhibits, and programs help residents and visitors understand the ecology of the island and take advantage of Nantucket's unique location to explore the night sky. The collections housed in these institutions are especially important for understanding the history of Nantucket and its transformation over time. Objects in the museums on the island are a part of the island's cultural heritage. For example, the exhibits and collections at the Nantucket Whaling Museum, a branch of the Nantucket Historical Association, help explain Nantucket's transformation from whaling capital of the world to vacation resort of today. The Nantucket Lightship Basket Museum helps us remember and promote a trade that is unique but struggling to survive. The Nantucket Shipwreck and Lifesaving Museum, owned by the Egan Maritime Institute, pays homage to the island's nautical history and recalls all the efforts over the years to save those lost at sea. The African Meeting House strives to teach visitors and residents about the rich African American history that influenced Nantucket. The Atheneum was the first building to be re-built after the fire of 1846, and still serves as the public library for islanders and the repository for many historical books, documents, and other artifacts that detail Nantucket's history and politics. The Artist's Association of Nantucket showcases the talent of local artists through exhibits and maintains a representative collection of their works. The items in these collections provide a history as well as a sense of pride for the residents living on the island.

Even among the relatively small number of museums and cultural institutions on Nantucket, the kinds of materials contained in their collections ranges broadly from letters and books to photographs and oil paintings and from cultural artifacts to natural history specimens. The small size of these museums and institutions does not diminish the importance of their collections; housing these collections in inadequately spaced areas and under incorrect conditions could cause them to be lost forever. In order to combat this, museums could enter a collaborative venture.

Collaborative Storage as a Solution

Because collections are so invaluable, it is imperative that they remain safe and in good condition. A possible solution to keeping collections protected for museums that might otherwise not have the proper space, staff, and/or finances for appropriate upkeep, would be to collaborate

with other museums in developing a shared collections facility. This facility would house pieces of a museum's collection, which are not currently on display, in a safe environment.

In order to make this a reality, extensive research and planning would have to go into developing a shared collections facility. Ironically, the library and archival community have been collaborating successfully for some time as a way to prevent inadequate storage and as a way to help cut costs. While collaborative storage amongst museums may be more challenging due to the diversity of collections, the benefits of a shared facility could outweigh the obstacles. An article written by the Museum Association in the United Kingdom states, "Collaborative approaches to storage can be a really sustainable and workable idea for museums…There are initial hurdles in organizing shared storage, with significant benefits later in terms of shared staff and HR, shared facilities, capacity to allow access to stores and reduced energy consumption" (Museums Association, 2009). While sifting through the initial obstacles will require staff, from executive directors to curators, to communicate their needs and concerns to figure out how to best run and organize the facility, after this process is complete the benefits are plenty. Heritage Preservation imagines, "…the potential for increased savings to institutions and safety to collection could be achieved by cooperative storage projects" (Heritage Preservation, 2006). A shared collections facility could allow participants to save money in various aspects including utilities, maintenance, and staffing because all the participating institutions would be sharing these costs.

While in the process of developing such a facility, it would be vital for interested parties to look into previous attempts by other organizations, which could provide a good basis of knowledge. Heritage Preservation suggests, "It could also be helpful to bring together those institutions that considered joint storage projects in the past to determine what caused the idea to fail" (Heritage Preservation, 2006). By looking into previous examples, whether successful or not, museums could learn how to implement a thriving shared collections facility. In particular, it may be helpful to look into examples of shared facilities that house similar objects, similarly sized objects, or similarly classified objects as those that the participating institutions contain. It would also be helpful to learn how other shared facilities organized the facility so as to accommodate the variety of objects and the way different museums classify their collections.

Classification of Museum Collections

Museums truly began as a result of the change in the manner in which people examined the natural world and history during the Enlightenment. People, wealthy men and scholars in particular, began to collect a vast array of objects to study. These collections spanned many categories, from societal artifacts such as vases and coins, to biological specimens. Classification was an intellectual exercise, but also arose from the need to increase the efficacy with which they stored and studied their growing collections. Many objects were classified in chronological order corresponding to accounts in ancient texts though other systems, such as differentiation based on notions of progress and specific criteria such as artistic style, were also used (The British Museum, 2003, p. 1). Natural history collections used various taxonomies according to discipline (biology, astronomy, geology, etc.).

Even relatively small museums may have hundreds or thousands of artifacts in their collections of all different types and sizes with varying storage requirements. In order to add more structure to all their possessions and establish efficient property management, museums must first set the categories into which they will separate the items in their collection. Classification systems are very diverse and there is no single system for all museums. Table 1 provides a visual representation of differences and similarities between the categories employed at various institutions. The majority of classification systems are hierarchal, meaning that there are major categories based on obvious differences which are then divided further by more specific dissimilarities (Department of Interior [DOI], n.d., para. 2). Following are some examples of different methods for classifying collections based on the protocols followed by the United States Department of Interior, the Institute of Museum and Library Services, the National Park Service, and the Yale Peabody Museum.

Table 1: Features of Four Different Museum Classification Systems

Classifications			
U.S Department of Interior	**Institute of Museum and Library Services**	**National Park Service**	**Yale Peabody Museum of Natural History**
Archeology • Time period • Materials • Site **Ethnography** • Cultural area • Cultural groups **History** • Structures • Furnishings • Personal artifacts • Communication • Transportation • Recreation **Documents** • Historical • Scientific **Art** • Method • Time period • Style • Artist **Biological specimens** • Taxonomic specifications **Fossils** • Site • Taxonomic specifications • Time period **Geology** • Rocks • Minerals • Surface process materials • Organic materials • Extraterrestrial materials • Soils **Environmental Samples** • Composite samples • Purpose of collection	**Audio-Visual materials** **Books** **Ceramics and glass** **Digital materials** **Living animals** **Living plants** **Metal** **Natural science specimens** **Organic materials** **Paintings** **Paper and ephemera** **Photographs** **Textiles** **Wood**	**Archival** • Personal papers and manuscripts • Resource management records **Cultural** • Archeology • Ethnology • History **Natural history** • Biological • Geological • Paleontological	**Anthropology** **Archives** **Botany** **Cryogenics** **Entomology** **Historical scientific instruments** **Invertebrate paleontology** **Invertebrate zoology** **Meteorites and planetary science** **Mineralogy** **Paleobotany** **Vertebrate paleontology** **Vertebrate zoology**

United States Department of Interior

As shown in Table 1, the United States Department of Interior (DOI) divides its collections into nine major categories. These nine categories are then broken down into smaller, more specific sub-categories according to Appendix D of the DOI's "Museum Property Handbook". The categories are a mix of disciplinary distinctions (e.g., archeology, geology) and type of artifact (e.g., documents, fossils). Accordingly, 'archeology' contains, "items recovered as a result of archeological techniques, including surface collection and excavation on land and underwater" (p. 2). The objects which fall under this category are then further classified by general time period, the material they are made out of, and may also be grouped by the site at which they were acquired. The ethnographic category includes objects made or used by Native American peoples. The Department of Interior specifies that, " 'Native American' refers to a contemporary Indian tribe, people, or culture indigenous to the United States, and includes any tribe, band, nation, or other organized Indian group or community of Indians , and natives of Alaska, Hawaii, and the U.S. territories." The objects in the ethnographic classification are then sub-divided by cultural area and then again by cultural groups in that area. Some of the cultural areas in North America include the Arctic, Basin, Caribbean, Northeast, Northwest coast, Plains, Plateau, Southeast, Southwest, Subarctic, and California. The 'history' classification pertains to artifacts housed in historical museums. Pieces that are placed under this heading are divided into structures, furnishings, personal artifacts, tools and equipment for materials, tools and equipment for science and technology, tools and equipment for communication, distribution and transportation artifacts, communication artifacts, recreation artifacts, and unclassifiable artifacts. According to the DOI, "Historical and/or scientific document collections refer to documents created, received, accumulated, or generated by a person or an organization in the conduct of affairs and management of resources." There are numerous discrete collections within this category. Art is another of the nine primary categories. Art is segregated by the method used to create it, the time period during which it was made, the style it represents and the artist who produced it. Biological specimens are separated by species and other biological categories used during their study. The Department of Interior defines a fossil as any evidence of life from an earlier geologic time. Fossils are placed in the paleontology classification and are sub-divided by many of the guidelines used for living specimens though time periods are also taken into account. The "Museum Property Handbook" states, "Geology collections may include rocks

(igneous, sedimentary, metamorphic, or fault-zone materials), minerals (grouped by their chemical composition), surface process materials (illustrating weathering by wind, stream, lake, marine, or glacial action), organic materials (hydrocarbons, resins, and bitumens), extraterrestrial materials (meteorites, tektites, and terrestrial impact features), and soils." There is some subjectivity to the geology category that depends on the museum's objectives since some of the sub-categories overlap. One example given by the DOI is that though a certain specimen collected is made of granite, which is an igneous rock, it was collected to document glacial striations and should therefore be classified as a surface process material. The last category introduced is the classification of environmental samples which includes the composite samples resultant from environmental research such as water, precipitation, air, and sediment. The purpose for which the sample was collected determines the sub-category it is divided into. This is illustrated in the example expressed in the handbook, "…if the purpose for taking a water sample is to study biota, then the sample may be considered a biology specimen."

Institute of Museum and Library Services

Another organization that has developed a classification system for museum collections is the Institute of Museum and Library Services (IMLS). IMLS provides much of the federal support available for the 123,000 libraries and 17,500 museums in the United States (Institute of Museum and Library Services [IMLS], para. 1). In order to work towards the preservation of heritage, culture, and knowledge through the care of the artifacts museums have in their collections, IMLS has divided collections into fourteen sections and provides information on and limited funding for their care. The IMLS utilizes a functional rather than disciplinary classification system (see Table 1) that reflects the nature of the artifacts and their particular preservation requirements and storage needs. The categories used by the IMLS classification system are audio-visual materials, books, ceramics and glass, digital materials, living animals, living plants, metal, natural science specimens, organic materials, paintings, paper and ephemera, photographs, textiles, and wood.

National Park Service

The National Park Service (NPS) has extensive knowledge of and expertise in managing a wide variety of types of collections, since it is responsible for the artifacts found, stored, and on exhibition at close to 400 national parks, historic sites, and other facilities (National Park Service [NPS], 2011, p. 1). Due to the copious number of artifacts contained within the NPS system, the

National Park Service has developed a broad classification structure (see Table 1) that differentiates objects into archival, cultural, and natural history categories (NPS, 2006, p. 10).

Archival collections include historic documents and other paper records, and according to NPS, "…archival collections contain information essential for understanding…past, natural and cultural interrelationships, events, and changes over time…" (2006, p. 11). The National Park Service then further classifies archival collections into personal papers and manuscripts, and resource management records. Personal papers create a better understanding of the people who wrote the documents and the time during which they were written. It gives current generations a chance to view history and discoveries through the eyes of those who experienced it. Resource management records are a written representation of the management of cultural and natural resources over time as well as the scientific research involving these resources.

NPS defines cultural collections as "human-made objects or natural history specimens collected because of their human cultural context" (2006, p. 12). Cultural collections fall into three sub-categories: archeology, ethnology, and history. Archeological specimens are remains found using archeological methods that help better the understanding of past cultures and their natural world. As stated by the National Park Service, "Ethnological collections may be from any contemporary culture or from the historical and traditional culture from which the contemporary culture and people are descended…Generally, but not always, NPS ethnological collections are from cultures considered indigenous" (2006, p. 12). Ethnological collections contain items that help further the comparative and analytic study of cultures and can include things such as Navajo blankets, Oglala headdresses, and Yokut baskets. History collections contain a wide assortment of materials made and used by people over time. NPS states that, "These collections may document individual or community life, and social, cultural, political, economic, and technological trends and events" (NPS, 2006, p. 15). There is an extensive range of objects that fall into this sub-category such as personal items, historic furnishings, religious artifacts, vehicles and artwork.

The natural history collection is very diverse and provides many specimens used for a variety of scientific and educational needs, such as determining the environmental changes that have occurred over time and providing holotype specimens used when a new taxon was first formally described. The specimens in the natural history collection are divided into biological, geological, and paleontological collections. Plants and animals constitute biological specimens

while geological specimens include rocks, minerals, surface process samples, and soils. Paleontological collections consist of plant, animal, and trace fossils.

Yale Peabody Museum

The Yale Peabody Museum is another institution that puts a classification system into use. The major focus of this museum is natural history, and because of this they have developed a unique scheme of organization. The Yale Peabody Museum categorizes their collection into thirteen distinctive sections (see Table 1) that reflect disciplinary distinctions more than distinctions in terms of the physical nature of the artifacts. These sections include anthropology, archives, botany, cryogenics, entomology, historical scientific instruments, invertebrate paleontology, invertebrate zoology, meteorites and planetary science, mineralogy, paleobotany, vertebrate paleontology, and vertebrate zoology (Yale Peabody Museum of Natural History, 2011, p. 1).

Classification systems not only provide a way through which collections can be organized, but also determine distinct groupings of objects that require similar environments for proper preservation. Staff involved with collections management at various museums and institutions use these groupings to then properly store and maintain artifacts.

Collections Management

Collections management is a multi-faceted system including varying activities for the acquisition, accountability, documentation, conservation, protection, disposition, and use of the artifacts held in collections (NPS, 2006, p. 3). This system is in place so that museum collections can be made available to people for exhibit and study, while also preserving them for future generations. Proper storage and maintenance are tools that promote the conservation and protection of the invaluable objects stored in collections. In order to efficiently store and maintain collections, the individual requirements of each type of object that can be held within the collection must be known and fulfilled. The following sections are arranged according to specific type of artifact and their storage and maintenance requirements.

Fossils, Paleontology, and Archeology

Some of the main categories found throughout numerous classifications are fossils paleontology, and archeology. These groupings are similar in that they contain items composed of similar materials, and therefore require comparable storage and maintenance. Though these artifacts often have survived millions of years buried in various parts of the world, once exhumed they require appropriate care in order to remain intact and valuable for research and educational purposes. In general, high temperatures increase the physical aging and deterioration of items in collections, but due to the age of the artifacts in these particular categories, temperatures that are too low increase the probability of thermal shock which then causes the artifacts to become brittle and crack or shatter. Temperature should be kept at a constant 68-70 degrees Fahrenheit in order to prevent damage from fluctuating temperatures (American Museum of Natural History, n.d. para. 1). Relative humidity (RH) is also a factor that must be taken into consideration when properly storing collection pieces. High RH stimulates oxidation and corrosion of certain materials. Relative humidity correlates to temperature because warm air holds more moisture than cool air, and therefore keeping proper temperature increases a museum's ability to maintain proper RH levels. Relative humidity must be kept close to 50% and variations from this level must be deterred. RH can be controlled through the use of environmental control strategies such as centralized air control, and radiators with window mounted air conditioning units. Appropriate door and window seals also aid in the control of relative humidity. When specifically referring to fossil, paleontological, and archeological collections, contaminants become highly troublesome. Dust can have abrasive qualities and attract pests and removing it from such ancient artifacts can cause damage to the objects. In order to decrease the consequences of improper storage, these artifacts should be stored in well-sealed cabinetry, though the caretaker of the collection should be vigilant in the case of the build-up of gaseous pollutants inside the cabinets. These items can suffer from pyrite disease, which results from oxidation and releases sulfuric acid, which can then damage other specimens stored within the same cabinet. According to the American Museum of Natural History, "any specimens suffering from pyrite disease should be isolated from the rest of the collection" (American Museum of Natural History, n.d. para. 6). Light exposure should also be limited when dealing with these types of collections. High levels of light can cause change of color of some minerals, change phase, or decomposition (American Museum of Natural History, n.d. para. 7).

Books

There is a wide range of materials from which books are composed, including paper, cloth, leather, paste, and glue. Due to the organic nature of these materials, books in collections are at risk from incurring damages caused by an unsuitable environment, particularly light, temperature, and humidity conditions. According to the American Institute for Conservation of Historic and Artistic Works (AIC), "…books should not be exposed to excessive amounts of light. Daylight and fluorescent light, which have high levels of ultraviolet radiation, cause the most rapid deterioration and fading. Normal incandescent house lights are less harmful, although all light causes some damage. Keep lights turned off in rooms that are not in use. Block daylight by using curtains, shades or plastic filtering films" (Books, 2011, p. 1). Aside from light, books should also be shielded from quick changes in or extremes of humidity. Hot and dry conditions (i.e., low humidity) make leather and paper wrinkled and brittle, but humidity levels that are too high encourage the growth of mold. In order to prevent damage caused by extreme humidity, books should be kept away from sources of heat and outside walls. Air conditioners, dehumidifiers, and humidifiers can also aid a museum in controlling humidity levels. Rooms where books are stored should be kept at around 70 degrees Fahrenheit and 50 percent relative humidity (American Institute for Conservation of Historic and Artistic Works [AIC] Books, 2011, p.1). When packing books for storage, they should not be wrapped in common plastics due to the harmful gases emitted as they degrade, but instead placed in alkaline corrugated cardboard boxes. Pests, such as rats, mice, silverfish, and small insects, are exceptionally attracted to book materials and should be watched for carefully by the caretaker of the collection, and eliminated by various means if found.

Archival Artifacts

Archival artifacts (i.e., letters, newspapers, maps, and other unbound documents) are often very fragile and require highly effective damage protection. One of the main sources of damage for these types of objects is exposure to light, which can cause fading as well as yellowing, darkening, and weakening of paper. Because damage from light is cumulative and permanent, light levels should be kept low, and daylight should be blocked out with shades, blinds, curtains or ultraviolet ray filters. Archival material should be kept in temperatures below 72 degrees Fahrenheit with a RH between 30 and 50 percent. Both conditions must be kept constant to deter moisture that promotes deterioration and mold growth, and attracts insects (AIC

Documents, 2011, p. 1). Sustaining constant conditions can also prevent paper from expanding and contracting which can lead to structural weakening of paper and cause distortions. Paper kept in frames and storage enclosures are protected from some fluctuations in environment conditions, but long-term damage will still occur if there are rapid changes in the environmental conditions. In addition to protection from fluctuating temperature and humidity, storage enclosures prevent damage caused by gaseous pollution and airborne particulates such as dust, soot, and soil. Documents that are not encased should be stored in folders within appropriate containers (AIC Documents, 2011, p. 2). According to the AIC, "Mats, folders, and storage boxes should be made of cotton rag, or 100 percent chemically purified woodpulp with an alkali reserve equivalent to two percent calcium carbonate and buffered to a pH of 7.5 to 10" (Documents, 2011, p. 1). Documents in relatively good condition can be stored in multiples within folders, though newsprint should be isolated due to its high acidity. Damaged and frail items should also be isolated to prevent further damage. Oversized objects, such as maps, are best stored flat in drawers constructed of anodized aluminum or powder-coated steel.

Photographs

When determining the proper conditions in which photographs should be stored, it is critical to note the complexity of a photograph's structure. Photographs are most often comprised of three components; a final image material, a binder layer, and a primary support. The final image material usually consists of silver, platinum, organic dyes, or pigments, and creates the image seen on the photograph. Albumen, collodion, or gelatins commonly make up the binder layer on which the image is suspended. The first two components are then attached to the primary support which is usually paper, glass, metal, or plastic. When not stored in a suitable environment, the three components of a photograph could react with each other and with the environment resulting in reduced longevity of the image (AIC Photographs, 2011, p. 1). To prevent detrimental reactions, photographic materials should be stored in an environment that is cool, dry, and well-ventilated. Deterioration and mold growth promoted by high temperatures and RH can tarnish the image and break down the binder layer. The life of photographs is greatly increased when stored at 68 degrees Fahrenheit with a relative humidity of 30 to 40 percent. If a museum collection also contains film-based negatives and contemporary color photographs, these objects should be stored at 30 to 40 degrees Fahrenheit. Storing photographs in attics, basements, or alongside the outside walls should be prevented due to the condensation that

occurs in these particular areas. Damage caused by dust and light can be prevented through the use of encasings, though due to the nature of the photographic components there are stringent requirements as to the materials which comprise the encasing. As stated by the AIC, "Chemically stable plastic or paper enclosures free of sulfur, acids, and peroxides, are recommended. Plastic sleeves should be constructed of uncoated polyester, polypropylene, or polyethylene…Paper enclosures should have passed the Photographic Activity Test (PAT), a test designed to determine the safety of an enclosure in contact with a silver photographic image. If PAT test results are not available, choose paper enclosures that are lignin-free, 100 percent rag or alpha-cellulose fibers, and have a white or off-white color" (AIC Photographs, 2011, p. 1). Film-based negatives should be kept separate because of the acidic gases they emit as they age. The individually encased photographs can then be amassed in acid-free, durable boxes in order to efficiently store a large amount, such as the many found in museum collections.

Metal Objects

Vast numbers of objects in museum collections are constructed from or include various metals. Due to the ease with which they corrode, the contact of metals with water, acids, bases, salts, oils, aggressive polishes, and other chemicals and gaseous materials should be prevented. A controlled environment can aid in the prevention of corrosion and preservation of metal objects. Relative humidity must be kept below 55 percent by using dehumidifiers and air conditioning to decrease the moisture in the air, and not storing these objects in basements where humidity is often alarmingly high. Archeological metal artifacts tend to be fragile and should be kept at a RH below 40 percent. Air pollution plays a large role in the degradation of metal surfaces due to the fine dust and debris that can accumulate on the objects and attract moisture, and should be protected against by using dust covers (AIC Metal, 2011, p.1). Gasses can also cause damage, such as the tarnish of black silver sulfide they produce on silver. Because of this metals must be stored in areas made of inert storage materials instead of wooden cabinets that produce acidic vapors. In order to increase the permanency of metal objects it is also advised to wrap them in metal cloths that slow the rate at which air reaches the object and decrease tarnishing. Containers in which metals are stored are most usually metallic with sufficient padding in order to prevent contact of the metal object with another metal, as well as preventing denting, scratching, and other physical damage (AIC Metal, 2011, p.1).

Scrimshaw

One of the greatest historical moments for Nantucket was the age during which it was the whaling capital of the world. The history of this time period and its significance is demonstrated through many of the artifacts in various collections on the island, particularly in the pieces of scrimshaw which are artistic engravings made on whale bone, teeth, and baleen. Due to its organic nature, scrimshaw easily interacts with its environment and requires specific and controlled storage conditions. When handling scrimshaw to put into storage, it is best to use white cotton gloves to avoid contamination with hand oils and dirt, or at least wash one's hands thoroughly with soap and water (Smithsonian Museum Conservation Institute, 2011, p.1). Scrimshaw artifacts are preserved most efficiently at a constant relative humidity of 45 to 55 percent and at a constant 70 degrees Fahrenheit. They should be kept in tightly closed dark storage drawers lined with chemically stable cushioning material such as polyethylene or polypropylene sheeting. Scrimshaw bleaches when exposed to light and should therefore be kept away from sunlit areas or interior light bulbs. To further protect these invaluable artifacts, the scrimshaw can be wrapped in un-buffered, acid-free tissue paper and sealed in a polyethylene bag (Smithsonian Museum Conservation Institute, 2011, p.1).

Due to the different conditions in which all the objects that make up a museum collection must be kept, it is difficult to place everything in one location. Extensive research and planning would have to go into developing a shared collections facility, such as the efforts described in the case studies below.

Case Studies

Perhaps the best way to identify the range of issues and potential solutions to the development of a shared storage facility is to examine other examples of such facilities. Unfortunately, there are relatively few examples available. Nevertheless, we have uncovered two examples that are quite illuminating in their details. One involves a facility in Vejle, Denmark, which encompasses 16 museums and archives, and the other from a facility in Colorado, which houses the collections of four major university libraries.

In 2000, four Colorado institutions, the University of Colorado at Boulder, the University of Colorado at Denver, the University of Colorado Health Services Center, and the University of Denver, came together to develop a shared collections facility. Individually, these university libraries were starting to run out of space to keep their collections so they decided to collectively

store their collections in a high-density facility, which is now known as the Preservation and Access Service Center for Colorado Academic Libraries (PASCAL). Initially, each library had its own online catalog system through which users could locate and request different material in the library's collection. For the new facility, a new program called Prospector was developed to merge the four library catalogs into one so any user searching the catalog could see PASCAL's entire collections.

In a case study of PASCAL, Scott Seaman, Associate Director for Administrative Services in Norlin Library at the University of Colorado at Boulder, identified four major issues that had to be addressed by the partners, including ownership of stored materials, selection of items for storage, operational management, and access (Seaman, 2005 p. 20). The librarians' major concern was the ownership of stored materials. The collections managers at these four libraries perceived that, "…jointly-owned, off-site materials could not be considered part of the local collection" and that each institution might not get credit for their entire collection (Seaman, 2005 p. 23). In order to address this 'misperception,' Seaman researched and found that even if some of each library's collections were off-campus, they would still be considered part of the owning library's collection. After getting past the first obstacle, the collection managers then had to decide which items would go into storage. The main concern being that anyone who accesses the Prospector program would be able to obtain access to the collections. Collections managers feared that some of the rare parts of the collection, like rare books, would then be made available to the public and potentially damaged. Accordingly, they were against the idea of adding them to the storage facility. While different parties argued about whether or not to allow all objects stored in PASCAL to circulate, finally it was decided that PASCAL would open with universal access and the rare collections would not be stored in the facility. In order for the facility to run smoothly, certain management policies needed to be implemented. The major issue regarding management revolved around the topic of unnecessary duplication of objects in collections. With similar programs, it was feared that some of the collections would overlap and there would be duplicate documents and books that would just take up space. The various parties found it hard to define what was considered unnecessary. First, they implemented a rule that there would only be a single copy of everything in the facility to ensure maximum space efficiency, however collections managers could not agree on this and argued, what would happen if the owning library needed to recall something from their collection to put back on its shelves, then the public

would not be able to get access. Finally, collections managers decided that the facility could hold for monographs, a single copy from each institution, and for serial volumes, only a single copy in PASCAL. This compromise allowed the facility to maintain the integrity of the institutions' collections while storing the objects efficiently. Today PASCAL is filled to about half of its capacity and has received requests to join from other institutions because of its success.

More recently, in 2003, a shared storage facility was built after the conservators from the regional conservation center in Vejle, Denmark raised money for a new building to house the collections of sixteen museums and archives. Lise Knudsen and Michael Rasmussen, from the Vejle County Cultural Heritage Centre, evaluated the existing conditions and storage needs to help create the specifications for a new shared storage facility. They identified five main steps in the planning process and developed objectives the new building would need to meet. First, they explored suitable locations, keeping in mind that the building should be in an area somewhat equidistant to every museum, an area with low air pollution and where it can be easily expanded to accommodate future acquisitions. Next, they evaluated key considerations regarding the construction of the building. In this regard, their main objectives were that the building should be easy to keep clean, easy to monitor for pests, and fire-resistant. After considering factors that would determine how the building was to be laid out, they addressed the issue of climate regulation. Particular considerations were how to satisfy the climate conditions for mixed collections, minimize fluctuations in climate, and design a roof that minimized the risk of leaks. Next, they addressed the specific storing systems that would best accommodate existing as well as future acquisitions. They determined that the storage system should provide easy access to all objects and should be in a room that will allow for objects ranging from very large to very small to be stored together with plenty of room. The last area of concern they looked into was security of the building to minimize risks of burglary. At the end of their project they noted, "The reason why this project succeeded was – according to the users – that the initiative came from the conservators, who had no other interests than the preservation of the collections" (Knudsen and Rasmussen, 2005 p. 654).

Due to the success of previous case studies, such as the two described above, more and more institutions are considering collaboration of collections as a viable option. According to an article from the University College Dublin website on August 22, 2011, the University College Dublin, Trinity College Dublin and the National Library of Ireland are planning to develop a

shared collections facility for their university libraries to make room for their growing collections.

Many of the considerations that arose in the previous attempts made by the institutions in Denver and Denmark will apply to the process of determining the possible success of a shared collections facility on Nantucket. (Additional examples of shared collections facilities were identified during interviews and are discussed in the findings below) In order to account for the issues identified in the previous case studies, the project team has developed a set of methods to employ while on the island.

Methodology

The goal of this project was to determine the feasibility of developing a shared collections facility for museums, town departments, and other institutions on Nantucket. In order to accomplish this goal, the project team identified five major objectives. These objectives included:

- Identifying potential participants;
- Conducting a needs assessment;
- Clarifying the standards for collections storage and management;
- Evaluating space options; and,
- Developing a set of recommendations for the implementation of this type of facility

In order to accomplish these objectives we performed a variety of tasks described below.

Identifying Potential Participants

Before determining the feasibility of developing a shared collections facility on Nantucket, the team first identified which institutions were willing to participate and their level of interest. To collect this data, the team contacted appropriate representatives from the Maria Mitchell Association, the Nantucket Historical Association, the Nantucket Lightship Basket Museum, the Egan Maritime Institute, the African Meeting House, the Atheneum, the Artist's Association of Nantucket, and the Nantucket Conservation Foundation. Some organizations had already expressed an interest in a shared collections facility through Janet Schulte, Executive Director of the Maria Mitchell Association. The team followed up on these initial contacts and identified other interested parties through a snowball sampling method. Having identified which institutions were interested in participating, the team proceeded by conducting a needs assessment at each institution.

Conducting a Needs Assessment

The project team conducted a needs assessment through in-depth, semi-structured, face-to-face interviews with appropriate staff at each institution and a supplemental 'walkthrough' site visit of the museums and their collections storage areas, both on and off-site as appropriate. The project team conducted these interviews within 30 to 60 minutes with the head of each organization along with other staff he or she identified as having responsibilities for the management and maintenance of the collections. These interviews took place in an office or

other convenient location. Since there was a possibility that the answers from the interview questions would be quoted in the documentation of the project; the team obtained permission from the staff member and granted them the right to review.

In addition to the interviews and the 'walkthrough' site visits, the project team also held a weekly meeting with the representatives from each institution to discuss major findings and/or topics from previous weeks. These meetings allowed the participants a chance to talk to each other about their opinions as well as their wants and needs for the proposed facility. The issues and topics raised in these meetings allowed the project team to communicate with the participants and to gain insight on what the participants wanted to see in such a facility, allowing concerns and quandaries to be addressed. Each week the project team wrote an agenda highlighting major topics to be discussed in the next meeting and sent it to all participants via e-mail in order to give them a preview. After each meeting the project team followed up by sending out minutes to recap what was discussed in the meetings to allow people who were not able to attend to stay informed.

Determining the size, nature, and condition of the current collections at the participating institutions was critical to the success of this project. The feasibility of developing a shared collections facility largely depended on the number and types of artifacts and ephemera that needed to be stored, since this determined the size and other requirements (e.g., temperature, humidity, etc.) of the storage facility. The team attempted to determine the volume of objects and their nature by using an existing inventory provided by participating institutions. If no existing inventory was available the project team used the measurements of the storage area currently in use by each organization. The majority of the institutions had storage units at Nantucket Storage which had pre-measured storage areas available for renting; therefore the team was easily able to obtain measurements. The needs assessment also included characterizing the existing collections space and identifying any concerns organizations had about this project such as cost and rental agreements, access, management and oversight, insurance, and the requirements involved with participation in a shared collections space. During the interviews the team also collected additional information regarding the problems and limitations imposed on the institutions as a result of their current storage arrangements, as well as the particular needs their ideal collections storage facility would satisfy.

Clarifying Standards for Collections Space

Clarifying standards for collections space took place once the project team had clearly established the different needs of the participating institutions. The team used the information obtained through the interviews to determine the volume of each type of artifact each organization would want to store and the specific concerns or requirements regarding their storage. The team continued to build on the literature review to identify the correct manner in which the objects should be stored, paying particular attention to the environment necessary to prohibit degradation of the items comprising the collections on Nantucket and the maintenance required for their proper upkeep.

Evaluating Space Options

To determine which would be the most advantageous location for this facility, the project team evaluated the specifications of both modifying an existing building to suit the organizations' needs and constructing a new building for this project's purpose. The team established if there were presently any structures that could fit the extensive collections owned by the institutions. At the beginning of this project there was interest in determining if the Nantucket Historical Association's (NHA) storage facility could be used for this project and the organization's interest in sharing their space. If the NHA was willing to allow the use of their facility, the project team needed to tour the building and get a sense of what is already there and how much room is available. The team also identified how the space was apportioned for different uses and what this meant in terms of the amount of space available for different types of storage based on the climate and other conditions. Many factors were taken into account when evaluating the space to be used for this facility, including the space available for the existing collections, space available for expansion due to acquisition, ability with which the environment in the space could be segmented into appropriate environments for each type of artifact, and cost analysis. Using these factors, the project team worked up a rough estimate of the size and type of building necessary to accommodate the various collections, and based on this developed some very rough cost estimates.

Developing Set of Recommendations

Once the team synthesized all the data that was gathered, a set of recommendations was developed. These recommendations presented whether the project team determined that a shared

collections facility is feasible for the organizations on Nantucket and suggested a method of accomplishing it through the use of information obtained during the interviews and weekly meetings. The recommendations took into account the needs of the organizations and the proper criteria for storing and managing each of the collections within a single space. Agreements that the institutions would have to consider in order to make the shared collections facility a successful venture were also part of the team's recommendations.

Findings

The Participating Institutions

To identify organizations that would be willing to participate in a shared collections venture, several representatives from different organizations were contacted after they expressed interest via Janet Schulte. The project team requested a meeting time with an appropriate representative during which interviews and 'walkthrough' site visits could be conducted, and determined potential participants based on response. The team received positive responses from the African Meeting House, the Artist's Association of Nantucket, the Atheneum, the Egan Maritime Institute, the Maria Mitchell Association, the Nantucket Conservation Foundation, and the Nantucket Lightship Basket Museum. All of the aforementioned institutions became participants, excluding the Nantucket Conservation Foundation who, after careful consideration, realized their needs differed from the purpose of the intended facility. The Nantucket Historical Association was also contacted though the organization presently owns collections storage facilities. The institution chose not to become a participant but instead provided useful information to the project team through a representative present at weekly meetings and a site visit of their existing facility, the Gosnold Center.

Needs and Options for a Shared Collections Facility

In order to determine the needs that could be met through the use of a shared collections facility on Nantucket, and discover the various options that could be utilized to make this facility efficient, the project team interviewed representatives from each of the participating organizations. The interviewees included executive directors and curators, giving the team a wide range of opinions and points of view. The information gained during interviews was bolstered by the wide ranging discussion among participants at our weekly project meetings. These meetings were attended by various representatives from each institution and were used to inform all those involved of our ongoing research, as well as promote discussion between representatives about key issues. These discussions garnered more opinions and ideas that the team then used to further clarify needs and develop options for the facility. Site visits to both on and off site storage areas of participating institutions presented an opportunity to witness the state of the collections so that the team could better understand the needs of the organizations. Visiting the Gosnold Center was also beneficial to the team by providing a model that could be used in the planning of the facility. Along with information gained from institutions on the

island, the project team also contacted other experts, such as Elizabeth Wylie, the director of business development at Finegold, Alexander, and Associates Inc., who has also written about green museums and been involved in the development of other shared collections facilities, and William Dunlap, the executive director of the New Hampshire Historical Society, whose organization recently concluded a study on a collaborative venture between statewide and regional New Hampshire collecting institutions.

By visiting the current storage spaces utilized by the participating institutions, it was evident to the project team that the conditions that the collections are in are not conducive to their preservation. Currently, the African Meeting House, Artist's Association of Nantucket, Egan Maritime Institute, and the Nantucket Lightship Basket Museum all have storage units at Nantucket Storage. Unfortunately these units do not provide appropriate lighting or shelving. Lighting is placed in the hallways but not in the actual storage units, causing the participants to require flashlights in order to view the pieces in their collection. This is problematic particularly for curators trying to piece together an exhibit. Lack of proper shelving also causes a hindrance by making organization difficult, as shown in Figures 2 and 3. It may seem that a solution to the crowded units would be to just rent more units, however this would increase annual storage costs. While the Maria Mitchell Association and the Atheneum do not utilize Nantucket Storage, their collections have also outgrown their storage spaces. In order to address their shortage of space, the MMA digitized its glass plate photos and moved them to a facility in North Carolina, unfortunately losing physical ownership of some of their valuable artifacts. The Atheneum built two climate controlled vaults to house their collections which are now at capacity and then some. Having their collection, which is mostly paper manuscripts and books, compacted into these vaults presents a constant fire hazard leaving the collections very vulnerable. After witnessing the immediate need for better storage areas, the project team developed options to facilitate the future planning of this facility.

Figure 2: Unit at Nantucket Storage

Figure 3: Unit at Nantucket Storage

Nature of the Facility

The nature of the facility depends upon the decisions made by the participating institutions regarding several factors. The major factors that were discussed included the tradeoffs inherent in constructing a new building as opposed to retrofitting an existing building, the necessary size and configuration of the facility, as well as how these choices affect the cost.

Old vs. New

One of the fundamental decisions to make in the planning of this facility is to determine whether building a new edifice or retrofitting an existing structure would be most beneficial. Constructing a new building would increase the ease with which the conditions necessary for the preservation of the artifacts could be met since it would be purpose built as a museum storage space. A new building also allows the participating organizations and future developers to design a layout at their convenience, allowing for the construction of an ideal structure. Though building a new structure presents many benefits, it could become costly due to land prices on the island and construction costs. A more economic option may be to retrofit an existing structure large enough to house the collections. Though the building may be less expensive if purchased for retrofitting, it may be more difficult to install museum quality systems into a structure not built for this purpose, and therefore may not produce ideal conditions for the collections.

The project team conducted interviews with staff members of the participating organizations, outlined in Appendix I, to determine which option would be preferred. Initially, both retrofitting an existing structure and constructing a new edifice were considered as viable options. During weekly meetings some vacant buildings around the island were discussed as potential locations, such as the Candle Street facility owned by National Grid and the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) facility. Additionally, the project team consulted the town assessor, Debbie Dilworth. Dilworth explained that the only existing building she could think of was the Gordon Folger Hotel which takes up about 38,000 square feet. Not only is this building too big for the needs of the participants but it is also located in a flood zone, which would allow for potential risk of damage to the priceless artifacts housed in the facility. Upon speaking with Elizabeth Wylie the conversation turned. The participants discovered that the possibility of constructing a new purpose-built structure would be more cost-efficient than retrofitting, and that the buildings being considered for renovation would not be available due to their location. The consensus of opinion was building a new structure due to the ease with which a new facility could meet the ideal conditions for the storage of the artifacts. As stated by Lincoln Thurber, head of the reference department at the Atheneum, “Building a new facility might be the easier way to get everyone’s needs” (personal communication, October 26, 2011). Other than the better conditions that could be provided by a purpose built edifice, a lack

of an appropriate building on the island also influenced the decision against renovating an existing structure.

Size of the Facility

Whether an old building was used or a new one was built, we needed to calculate a rough estimate of the size of the facility in order to determine potential cost, security options, and the like. There are many factors that can influence the size of the facility including the space needed to appropriately store the collections and the configuration chosen for the facility. Throughout the first four weeks, the project team collected measurements of each institution's collection. This was accomplished by using either existing inventories, rough estimates from representatives of the institutions, or using the measurements of the storage area currently in use if the other two options were not available. Since most institutions had storage units at Nantucket Storage, which rents pre-measured units, the measurements were easily obtained. As demonstrated in Table 2, the project team estimated the storage space needed for the current collections to be about 6,300 square feet (which is approximately the same size as the NHA's Gosnold facility). Table 2 shows that the collections are all quite varied and each institution has substantially different space needs in terms of both size and type of storage. Of course, this complicates not only the nature of the building needed, but also the management options.

Table 2: Space Needs by Organization

Organization	Nature of collection	Space needed (sq. ft.)
African Meeting House	Books, manuscripts, paper records, furniture, gramophone records	600
Artist's Association	Paintings, sculptures	800
Atheneum	Books, newspapers, manuscripts	1,200
Egan Maritime Institute	Paintings, lifesaving equipment, paper records	800
Lightship Basket Museum	Baskets, paper records	600
Maria Mitchell Association	Books, natural science specimens, manuscripts	2,300
Total:		6,300

Building Configuration

The project team developed building configuration options based on various needs that the facility could potentially fulfill due to a lack of immediate consensus on what kind of space was necessary. Initially, many participants saw this only as a basic storage facility, much like the facility several currently use at the airport, and they were most concerned about how to ensure the safety and security of their collections. Over time, the conversations broadened to explore various building configuration options, including even the incorporation of a receiving room and work/research space. In discussing these options, the participants also necessarily explored issues of management, access, security, and the cost implications of the different configurations. The major need that this facility must meet for every organization is suitable storage for their collections which might cause the facility to be strictly a storage area. This configuration would create the smallest, most inexpensive facility and could also keep the number of people accessing the facility to a minimum, therefore increasing security. Though this configuration is the simplest and easiest to manage, it makes maintenance problematic. Objects in need of care would have to risk damage to be transported to a working area and then again when being returned once fixed. A configuration containing both storage space and multiple work areas, such as the Gosnold Center, could reduce this risk by allowing maintenance to occur within the facility. Multiple work areas would allow for dissimilar collections to be worked on in separate rooms, which would help combat contamination. For example, if archival material were to be worked on in the same room as a specimen form the natural science collection, a speck of something left behind from the specimen could get on the archives, cause deterioration, and then cause the document to be lost forever. In addition to deterioration, the speck could also attract pests to the object, which could destroy the object as well as surrounding objects if the infestation goes unnoticed. The work areas would be beneficial to curators working on the collections and could also be areas where researchers could study artifacts; but they would also increase the cost of the facility by requiring extra space and suitable maintenance equipment. A multiple floor facility is an important option for the participants to consider as a way to cut costs. Andrew Vorce explained that a multiple floor facility will split the overall square footage between the floors. This would allow the participants to purchase or lease a smaller property. Another configuration option was presented to the team during an interview with Elizabeth Wylie, and though it would be the most expensive option, multi-purposing the facility's site to include low-budget housing for museum

staff could attract developers as well as increase the likelihood of obtaining funding for the facility.

When presented with these options during a weekly meeting, the representatives had varying opinions. Some organizations envisioned the facility as strictly storage space and believed this configuration to be the most cost effective. Some, such as the Artist's Association of Nantucket, did not express any need for a work space and therefore a facility only offering storage space would meet their needs. On the other hand a number of institutions conveyed a desire for an area where collections could be worked on. Jascin Finger, curator of special collections at the Maria Mitchell Association, stated that a research area would be beneficial. The configuration including housing was considered due to the funding it could bring in though many of the representatives had concerns regarding housing management.

After discussing other aspects of the building, the participants brought attention to two rooms that they felt would be necessities and need to be factored into building configurations, a bathroom as well as a mechanical room, where a furnace would be located. In addition to these two rooms, the participants discussed the need for a receiving room, similar to that in the Gosnold Center, in which objects would be checked for pests before being entered into storage. While this type of room would certainly add to the square footage of the building and therefore the costs, it would be an important feature especially when acquiring new objects in order to prevent existing collections already in storage from being contaminated.

Facility Construction Costs

The different configuration options add a different amount of square footage to the building and thus affect construction costs. These construction costs do not include equipment, security devices, operation, and staffing/management costs. Using obtained measurements, the project team was able to estimate the construction cost using the formula given to the team by Elizabeth Wylie. Wylie's formula takes the square footage, adds on 30 percent for walking space, and then multiplies that number by $400 per square foot. Table 3 outlines some of the different configuration options and their corresponding square footage and rough costs. The most simple and cost efficient option would strictly allow for storage space and nothing else. This option includes enough square footage to house the existing collections and leaves room for about ten percent growth as the collections grow over the years. This alternative provides the least amount of square footage which therefore means that it is the least expensive option.

Another option would be for the building to contain the same amount of storage but also include a bathroom and a mechanical room. The measurements for these two extra rooms were based on space usage for these purposes at the NHA's Gosnold Center. Addition of these rooms adds on about 214 square feet, which increases the size and costs but not too dramatically. Much like the addition of a bathroom and mechanical room, the addition of a receiving room and work rooms are also going to increase square footage and costs as well. Measurements for the receiving room and work room were taken from the Gosnold Center, however the measurements of the receiving room were cut in half, using 430 square feet instead of 860 square feet, since the participating institutions would not need a room as large as theirs but the square footage of the work rooms, 300 square feet each, were kept the same. Depending on how many work spaces the participants want will determine the overall square footage and costs. As a rough estimate of construction costs, the project team calculated the cost of a facility with a storage space with ten percent growth, three work spaces, each for different types of objects to prevent contamination, a receiving room, and the necessities. The construction costs for this option would be about $4.4 million. Also using numbers provided by the NHA, the project team estimated that the operation costs for this option would be about $48,000 per year not including staffing. As can be seen by these different options, the costs will adjust depending on the configuration that is chosen. Regardless of the configuration ultimately chosen by the organizations, the facility will have to be carefully managed to ensure its success.

Table 3: Construction Costs of Different Configuration Options

Configuration	Size (sq. ft.)	Cost
Storage	6,900	$3,600,000
Storage with necessities (bathroom & mechanical room)	7,100	$3,700,000
Storage with receiving room	7,400	$3,800,000
Storage with 1 work space	7,200	$3,800,000
Storage with 2 work spaces	7,500	$3,900,000
Storage with 3 work spaces	7,800	$4,000,000
Storage with 3 work spaces, a receiving room, and necessities	8,500	$4,400,000

Management Options

Management planning is one of the top priorities when determining how multiple organizations will run and use the facility. Management issues cover a lot of turf and vary with the nature of the facility. Aside from just how the participants will oversee the operation, there are specific management issues in terms of access, security, and insurance. Once a management plan has been devised, the organizations will have a better sense of their responsibilities as participants in a collaborative venture. In order to develop potential management options, the project team sought the aid of William Dunlap who had undergone a similar process when his organization, the New Hampshire Historical Society, concluded a study on a potential collaborative storage space in conjunction with the Currier Museum of Art, Strawbery Banke, Canterbury Shaker Village, the Historical Society of Cheshire County, the Manchester Historic Association, the Nashua Historical Society, and the Peterborough Historical Society. During their feasibility study a couple of management options were discussed. One of the options involved naming one organization as a senior partner who would foot the costs of the facility and manage the facility while allowing the other organizations to be named junior partners and granted the right to rent space from the senior partner. Another potential management model was creating a third party entity with the participating organizations as shareholders. Along with the management models presented by Dunlap, the project team also developed a third option which would involve creating a committee of representatives from each participating institution and allowing them to vote and/or volunteer for responsibilities. When the topic was broached during a weekly meeting, Cecil Jensen, executive director of the Artists Association of Nantucket, presented a fourth management option in which the facility would be managed by a different organization each year, allowing the organizations to rotate accountability.

The aforementioned management options could be of use to the participating organizations on Nantucket. The option involving naming a senior partner would be simple since it would hand all accountability to one organization without a need to allocate responsibilities. Although simple, it may become troublesome when deciding which of the participating institutions should be named senior partner, particularly because the small size of the organizations taking part in this venture could prevent any one institution from being able to front all of the costs. The same simplicity of having one organization in charge of management extends to the option where a different institution would be in charge of management each year,

and although no one institution would have to foot the costs, this option could become problematic for the staff of the institutions. The organizations involved are small in size and being responsible for such a large facility may significantly increase the workload of the staff of the responsible organization. If the representatives chose to create a third party entity it would alleviate the organizations themselves of the management, though it would increase costs due to the wages that would have to be paid to the third party. Compared to the other options, creating a committee of representatives to manage the facility allows the organizations to split responsibilities more equally though there would be no clear leading organization to ensure that all tasks are assigned.

Security Options

An important facet of responsibility that the entity in charge of management must be constantly aware of is ensuring the security of the priceless artifacts that could be stored in this facility. There are myriad ways by which the collections can be secured. One option is staffing the facility. The security staff could work office hours, during the time that the facility could be visited. An appointed security staff member could also make a nightly round to ensure the continued security of the facility. Though having a security staff would give peace of mind to the organizations, when discussing this option during a weekly meeting, the project team was made aware that employing security staff would increase the operating costs of the facility. Many representatives expressed that due to finances, using technology could be a more viable option. Cameras could be strategically installed to monitor the areas where collections are kept. The camera stream could be monitored in a number of ways depending on which method of management is chosen by the organizations as plans for the facility are solidified. If there is a senior partner, third-party entity, or single organization in charge of managing the facility the stream could be monitored by staff from that institution. On the other hand, if there is a committee the stream could be watched by the organization that volunteers to head security. Cameras could also be used in conjunction with security staff by having staff members monitor that video feed. Security also involves keeping parties from accessing the collections without the consent of the appropriate organization. For this purpose a number of representatives stated that a fence, such as the one found at Nantucket Storage, could be installed around the facility and require an access code to allow passage to those sanctioned.

Another facet of security includes limiting the number of people who have access to the valuable collections. The current security arrangements at Nantucket Storage consist of a fence around the facility which only allows access to those with a security code and individual units are locked by renters. During weekly meetings, the participants discussed who would have access to the facility and their individual collections. Although the participants did not come up with definitive protocols for access, they all agree that access to their individual collections should be limited to the organization's staff and approved visitors and that presence of staff housing located on the property may affect the protocols they ultimately choose.

Equipment Options

Another way to protect the collections is to guarantee the presence of proper equipment. Proper equipment elongates the lifespan of the collections by protecting them from light, contaminants, and pests. The proper equipment used for storage, some of which is outlined in Table 4, enables the participants to efficiently use the space available in the facility as well as allowing them to organize their various pieces. The presence of an efficient fire suppression system also protects the collections. The fire suppression system must not only react quickly and prevent the spread of flames in the facility, but also not cause unnecessary damage to the collections. As shown in Table 5, the various systems use different techniques to extinguish fire and present various options that could be used in the facility. An efficient HVAC system is necessary for climate control. The HVAC system coupled with proper equipment and a fire suppression system creates an ideal environment for the collections.

Table 4: Outline of Various Proper Storage Equipment

Type	Cost/Unit	Size (inches)	Capacity
Sliding Storage	$1,300	48x138x74	800 lbs.
Industrial Steel	$180	36x24x87	800 lbs.
Bulk Storage	$280	96x24x96	2,750 lbs.
Steel Shelving	$120	60x36x36	1,850 lbs.
Plastic Shelves	$94	71x18x37	150 lbs./shelf
Commercial Shelving	$96	75x36x18	375 lbs./shelf

Table 5: Fire Suppression Systems

DuPont FM 200	Fire Sprinkler	ECARO-25
• Waterless • Safe for people and collections • Takes up less space than water suppression • Quick to react • Expensive • Easy to clean	• Uses water • Safe for people but potential damage to artifacts/collections • Contains fire more than it extinguishes • Cheaper • Better for 3D objects, not paper products	• Waterless • Fairly easy to clean • Small diameter piping (more cost effective) • 20% less agent than FM 200 • Expensive

Location Options

Land is scarce on Nantucket; therefore it was very important to determine where on the island this facility could be located. During interviews and weekly meetings the project team asked participants where on the island they envisioned the proposed facility could be located. The majority of the group stressed that it is imperative that the facility be located in an area where flooding is unlikely. A few locations were discussed, however in order to determine if these locations were really options and what other locations this facility could be located, the team interviewed Andrew Vorce, Director of Planning on Nantucket. In order to actually determine the location options, first it was important to establish what kind of zoning such a facility would require. Vorce explained that the facility would be categorized as interior/exterior storage and warehousing and would therefore not be allowed in any residential areas on the island. The only locations on the island where this facility would be allowed by right would be in commercial industrial zones, which are very limited on the island and located around the airport. There are several lots that are large enough to encompass the facility including lot 13 on the Subdivision Plan of Land, which contains 24,875 square feet of land. The project team learned that land in commercial industrial zones requires 50 percent ground cover, which means that the parcel of land would have to be double the amount of square feet the facility takes up. For example, if the facility were to take up about 11,000 square feet the minimum amount of land required to build on would be 22,000 square feet. In the industrial district, each 5,000 square foot lot costs about $450,000-$600,000, however most of the land is not up for sale rather a long term leasing option. Another option that would be available would be dependent on whether or not the facility is multi-purposed. If the facility were to be multi-purposed, it could count as an accessory and could then potentially be located in commercial neighborhood, village

neighborhood, or village trade entrepreneurial craft (VTEC) zones by special permission only. These zones would require a larger parcel of land and would therefore be a more costly option than building in the commercial industrial zone.

Conclusions & Recommendations

Based upon the interviews conducted and the supplemental 'walkthrough' site visits, the project team concluded that there is a definite need for this facility on Nantucket. Currently the priceless and irreplaceable artifacts housed by the participating institutions are in great risk of deterioration due to the improper conditions in which they are kept. The facility would provide the proper climate control and storage areas necessary to preserve the valuable objects for future generations. The organizations involved are small in size and therefore do not have the finances or space to create a climate controlled area for their collections individually but, through a collaborative effort such as the proposed facility, the pooling of resources could ensure a safe and proper environment for the historic objects in their care. The existing storage areas are not equipped well enough to guarantee the survival of pieces through which Nantucket culture and heritage are kept alive, and therefore the project team highly recommends that there be continued research and planning for this facility.

The project team recommends that the participants strongly consider building a new structure to be used as the proposed facility. While the topic of an existing building versus a new building was initially discussed in interviews and meetings, it was determined that there are no existing structures that would meet the needs of the organizations. Not only would the existing building have to be of appropriate size, but it would also have to meet the appropriate zoning requirements. Taking these factors into consideration, it would be very difficult for the participants to find an existing structure that would be suitable. While retro-fitting a building might be appealing at first from a financial standpoint, in the long run it will most likely be more costly. An existing building would require working with what is already there or completely redoing the inside of the building. Installing all the proper equipment could also be problematic. With the information gathered from several professionals, the project team concludes that it is in the participants' best interest to construct a new building.

Due to its small size, land is a scarce commodity on Nantucket Island. After learning from Andrew Vorce, Director of Planning, that this facility would likely need to be located in an area zoned for industrial purposes, we concluded that there are very limited parcels of land that would be suitable. Of the land suitable for this facility, much of it is located by the Nantucket Memorial Airport and it is recommended that the facility be placed there. Unfortunately, in the industrial district, each 5,000 square foot lot costs about $450,000-$600,000, and given set-

backs, a parcel of approximately 22,000 square feet would be required at an approximate cost of $2.0-2.6 million, as shown in Table 6.

From the interviews and weekly meetings with participants, the project team was able to determine that a work/research space is needed. While not every institution would need an area for work/research use, the majority felt it would be a good addition and ultimately add to the safety of the collections. For example, if the participants have to go to the facility and take a piece from their collection back to their museum for it to be worked on and/or researched, this unnecessary transport could incur damage to the object. Since the goal of the facility is to protect the various collections from damage, not having a work space seems to be counterproductive if the participants feel it would be properly utilized. For these reasons, the project team feels that it would be most beneficial to have three work/research spaces. The rooms could be separated into archival, paintings, and natural science collection use. These three broad categories would cover all the bases and would allow the collections to be worked on as well as prevent contamination.

Based upon the rough construction cost estimates, the project team concludes that the construction costs directly depend on the configuration of the building. Depending on which configuration the participants choose it is going to directly affect the construction costs and operating costs. If the configuration with just storage space is chosen, the construction costs are obviously going to be lower than if the configuration with storage space, a receiving room, and work rooms is chosen. The project team recommends that the participants choose the option that includes, a storage space, a receiving room, and work rooms because although the most expensive option, it will allow them to not only store but maintain their collections all in one place. Annual utilities (i.e. primarily HVAC) would cost approximately $48,000. Additional operating costs would include the costs of security and staffing (including management oversight), but these costs would vary based on the management model and security arrangements chosen and we have not tried to estimate them here. A multiple floor facility is an important option for the participants to consider as a way to cut costs. The project team recommends that the participants consult with architects and developers to determine the most efficient and economical way to lay out the facility.

Table 6: Summary of Costs (1 story facility)

Capital Costs	
Construction (11,000 ft^2 building)	$4.4 million
Land (in industrial zone)	$ 2.0 - 2.6 million
Equipment (HVAC, storage, fire suppression)	-
Operating Costs	
Utilities (primarily HVAC)	$48,000 per year
Staffing (including management oversight)	-
Security	-

Based on the conditions witnessed during the 'walkthrough' site visits the project team concludes that the proper equipment is not always being used thus endangering the lifespan of the collections. As a way to ensure the safety of their collections, the project team recommends that the participants closely look into the proper storage equipment as well as climate control systems. The proper equipment used for storage is essential for the survival of the collections as it protects them from light, contaminants, and pests and in order to determine which one would be most appropriate for the facility the participants should investigate more thoroughly. The project team also recommends that the participating organizations seek the aid of a professional regarding the proper installation and use of an HVAC system that will provide the best climate control available for the collections.

The high cost of land and building on the island coupled with outfitting the facility with efficient HVAC and fire suppression systems as well as museum quality storage compartments ensures that the facility, though necessary, may become a costly venture for the participating organizations. The project team recommends looking into possible sources of funding and grants to financially aid the organizations. Grants could be gained through a variety of sources including the Institute of Museum and Library Services (IMLS) and the National Endowment for the Humanities (NEH), which is "an independent grant-making agency of the United States government dedicated to supporting research, education, preservation, and public programs in the humanities" (National Endowment for the Humanities [NEH], 2011). The NEH gives preservation assistant grants which "help small and mid-sized institutions—such as libraries, [and] museums…-improve their ability to preserve and care for their significant humanities collections" (NEH, 2011). Grant giving institutions might be more inclined to fund this type of facility if the participants consider the benefits of multi-purposing the site and/or making it a

green facility. As advised by Elizabeth Wylie, the addition of housing for staff members to address the shortage of affordable living on the island to the facility may make more grants available. More grants may also be accessible if 'green' options are chosen, although these options often raise the initial capital costs. Apart from grants, it is recommended that the participating institutions also look into gaining funds by renting out space to private parties such as local art collectors that need a safe area to store their art. Another option that may be economically advantageous for the organizations to make is to develop a lease to own contract with a developer. This would reduce the initial costs of the facility and allow the organizations to move on with the plans for the facility with fewer funds raised.

After speaking with William Dunlap about his experience participating in a similar feasibility study and discussing the topic of management during weekly meetings, the project team concluded that there are various options for the management of this facility. The team recommends that the participating institutions discuss their opinions about each option in order to determine which one would best fit their needs. The team believes that, of the possibilities presented, the most suitable options for the organizations on Nantucket would be to create a committee of representatives from each institution and allow them to vote and/or volunteer for responsibilities or to allow the responsibilities of managing the facility to rotate yearly between the organizations. Developing the committee would be similar to a system already in place between many of the participating institutions and may therefore be the easiest to implement on this facility. It would also allow the management to further the collaboration occurring through the planning and use of this facility. Allowing one institution to manage the facility each year would decrease the chance of any miscommunication preventing all responsibilities from being fulfilled and could simplify the management of the facility.

References

American Association of Museums. (2009). Retrieved on Dec. 9, 2011 from http://www.aam-us.org/aboutmuseums/abc.cfm#visitors

American Institute for Conservation of Historic and Artistic Works: Books (2011) Retrieved on Dec. 9, 2011 from http://www.conservation-us.org/_data/n_0001/resources/live/books.pdf

American Institute for Conservation of Historic and Artistic Works: Documents and Art on Paper (2011) Retrieved on Dec. 9, 2011 from http://www.conservation-us.org/_data/n_0001/resources/live/paper.pdf

American Institute for Conservation of Historic and Artistic Works: Metal Objects (2011) Retrieved on Dec. 9, 2011 from http://www.conservation-us.org/_data/n_0001/resources/live/metalobjects.pdf

American Institute for Conservation of Historic and Artistic Works: Photographs (2011) Retrieved on Dec. 9, 2011 from http://www.conservation-us.org/_data/n_0001/resources/live/photographs.pdf

American Museum of Natural History. (n.d.) Retrieved on Dec. 9, 2011 from http://collections.paleo.amnh.org/6/storing/storage-environments

The British Museum (2003). Retrieved on Dec. 9, 2011 from http://www.britishmuseum.org/explore/online_tours/britain/enlightenment_classifying/enlightenment_classifying_the.aspx

The Field Museum. (2011). Retrieved on Dec. 9, 2011 from http://fieldmuseum.org/explore/our-collections

Institute of Museum and Library Services. (2010). Powerpoint. Retrieved on Dec. 9, 2011 from http://www.imls.gov/assets/1/AssetManager/CtoCReport.pdf

Heritage Preservation. (2006). Retrieved on Dec. 9, 2011 from http://www.heritagepreservation.org/hhi/Luce5.pdf on Dec. 2, 2011.

Heritage Preservation and the Institute of Museum and Library Services. (2005). Powerpoint. Retrieved on Dec. 9, 2011 from https://www.heritagepreservation.org/HHI/HHIsummary.pdf

Institute of Museum and Library Services. (2011). General format. Retrieved on Dec. 9, 2011 from http://www.imls.gov/

Knudsen, L. R., & Rasmussen, M. H. (2005). Building a new shared storage facility for 16 museums and archives. Paper presented at the Triennial Meeting (14th), the Hague, 12-16 September 2005: Preprints, 648-654, figs.

Maria Mitchell Association. (2011). Retrieved on Dec. 9, 2011 from http://www.mmo.org/about/mission.html

Moore, K. (1994). Museum Management. Retrieved on Dec. 9, 2011 from http://books.google.com/books?id=Chkt5shQ0_IC&pg=PA32&lpg=PA32&dq=primary+goals+of+museums&source=bl&ots=WWcIydx4jz&sig=ymz-g5WgFBC6dHunUlqXZJxGNVI&hl=en&ei=CoV_TsHfA6b30gGf4pnzDw&sa=X&oi=book_result&ct=result&resnum=1&ved=0CB0Q6AEwAA#v=onepage&q=primary%20goals%20of%20museums&f=false

Museums Association. (2009). *MA response to NIMC Collections Development Strategy Consultation*. Retrieved on Dec. 9, 2011 from http://www.museumsassociation.org/publications/17935 on Dec. 2, 2011.

Nantucket.net. (2011). Retrieved on Dec. 9, 2011 from http://www.nantucket.net/comm/facts.php

National Endowment for the Humanities. (2011). Retrieved on Dec. 9, 2011 from http://www.neh.gov/whoweare/index.html

National Park Service. (2006). *National Park Service Museum and Collections*. Retrieved on Dec. 9, 2011 from http://www.nps.gov/history/museum/publications/MHI/Chapter1.pdf

National Park Service. (2011). *National Park System*. Retrieved on Dec. 9, 2011 from http://www.nps.gov/news/upload/CLASSLST-395_08-28-11.pdf

Natural History Museum. (2011). Retrieved on Dec. 9, 2011 from http://www.nhm.ac.uk/nature-online/collections-at-the-museum/why-are-collections-important/index.html

Seaman, S. (2005). Collaborative Collection Management in a High-density Storage Facility. College & Research Libraries, 66(1), 20.

Smithsonian. (2010). Retrieved on Dec. 9, 2011 from http://newsdesk.si.edu/factsheets/fact-sheet-smithsonian-collections

Smithsonian Museum Conservation Institute. (2011). Retrieved on Dec. 9, 2011 from http://www.si.edu/mci/english/learn_more/taking_care/ivory.html

The Society for the Preservation of Natural History Collections. (2010). General format. Retrieved on Dec. 9, 2011 from http://www.spnhc.org/10/why-collections-matter

Suarez, A.V. & Tsutsui, N.D. (2004). The value of museum collections for research and society. *Bioscience*, 54(1), 66-74

Town and County of Nantucket Massachusetts. (n.d.). Retrieved on Dec. 9, 2011 from http://nantucket-ma.gov/Pages/NantucketMA_WebDocs/about

UCD University Relations. (2011, August 22). New Collaborative Storage Facility in Bid to Conserve Ireland's Library Collection. Retrieved on Dec. 9, 2011 from http://www.ucd.ie/news/2011/08AUG11/220811-University-Libraries-and-the-National-Library--Ireland-Join-Forces-in-New-Collaborative-Storage-Facility-in-Bid-to-Conserve-Irelands-Library-Collections.html

United States Department of Interior. *Museum Property Handbook* [Data File]. (n.d.) Retrieved on Dec. 9, 2011 from http://www.doi.gov/museum/policy/pdf/mphii-d.pdf

Yale Peabody Museum of Natural History (2011). General format. Retrieved on Dec. 9, 2011 from http://peabody.yale.edu/

Appendices

Appendix I: Interviews

Section 1.1: Lincoln Thurber and Molly Anderson Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the Atheneum? What is your position within the institution? What exactly does your position entail?
    - Lincoln Thurber has been at the Atheneum since May 2001, 10 years as the head of the reference department. He oversees the reference collection, public access computers (10 machines), and special collections (books & manuscripts).
2. Why is the Atheneum interested in the idea of a shared collections facility?
    - There isn't sufficient space and they institution couldn't undertake the expense of a facility on their own. It also wouldn't be cost efficient to obtain their own facility.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?
    - Mostly books and manuscripts, letters, and newspapers (1817-present), some artwork
2. Where are your collections currently stored?
    - They are kept at the Atheneum, some in the Great Hall, others in the 2 vaults built in 1996.
3. How are your collections stored with regard to all the different objects?
    - n/a
4. How much floor space does each type of collection currently take up?
    - Linear feet will be provided to the project team
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a
6. What particular objects or kinds of objects are most difficult to store without damage?\
    - n/a

7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage? What could be done to avoid the damage?
    - A painting suffered damage due to improper storage. An edge was kicked in and it required professional restoration.
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - The Atheneum is more of a public library instead of a museum now so there will be very minimal growth, if any.
10. How often are they examined for damage?
    - Collections are inspected once a week.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more efficient method for pest control.
    - The main need is climate control to stabilize collections.
12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - Many of the books are deteriorating and therefore the greatest eed is for climate control.
13. Do you have an existing inventory of your collections?
    a. Is this a paper and/or electronic inventory?
    - Paper inventory
    b. How is the inventory arranged (e.g., by object, type, etc.)?
    - It is arranged by type of object: drawings, documents, furniture & decorative arts, ivory, maps, paintings, photos, prints, sculptures, ship models, silver, and textiles
    c. Is it maintained as a database?
    - n/a
    d. How is it kept up to date and by whom?
    - n/a
    e. Would it be available for us to use for our study?
    - Yes

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - Some of the advantages are the sharing of information and the intellectual access provided by placing all the different organizations' collections in one facility.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - Building a new facility would be better because it might the easier way to meet everyone's needs.
3. Do you know of any existing building that could be renovated for such uses?
    - The MSPCA building and the Bancroft building
4. What kinds of features would you want to see in such a facility?
    - A union catalogue to bring together disparate catalogues and a proper sprinkler system
5. What are some of the concerns you have about developing such a facility?
    - Ensuring that the objects are properly secured and labeled so that they go back into the right place when moved.

Section 1.2: Jascin Finger Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the MMA? What is your position within the institution? What exactly does your position entail?
    - 25 years, has been volunteering here since she was 12 years old. Jascin is the curator of special collections and archives and as such writes grants, does the daily housekeeping of artifacts, and plans classes.
2. Why is the MMA interested in the idea of a shared collections facility?
    - The artifacts are just in a bad situation. They are not properly stored in insufficient space.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?

- Historic artifacts, photos, textiles, ceramics, metals, art, framed documents, and telescopes

2. Where are your collections currently stored?
    - They are stored at the Mitchell House and the MMA building.
3. How are your collections stored with regard to all the different objects?
    - n/a
4. How much floor space does each type of collection currently take up?
    - A detailed description of space needs will be provided to the team.
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a
6. What particular objects or kinds of objects are most difficult to store without damage?
    - n/a
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - Years ago there was a flood in the wing which caused some water damage to some documents.
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - The MMA does not expect growth of special collections or other categories though the institutional archives may expand very little over a large period of time
10. How often are they examined for damage?
    - There is an ongoing check for damage done on a daily basis.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.
    - n/a
12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - Greatest concern is the current state of the storage for the collections.

13. Do you have an existing inventory of your collections?
    - The MMA has an accession as well as space evaluations done for the Conservations Assessment Program Grant and the Northeast Document Conservation Center that will be made available to the project team.

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - It is a way to save money. The collaborative effort may make it easier to obtain grants and be helpful due to the lack of space on the island.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - A new building would be better.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - A separate entry for each organization. A really cold area for photos and negatives as well as proper drawers and shelving. Each group should be responsible for their own space in order to get rid of the need to hire someone.
5. What are some of the concerns you have about developing such a facility?
    - It should be away from the airport and areas that readily flood to prevent damage from occurring to the facility. A research area would be beneficial but it would require separation to prevent cross contamination between object types.

Section 1.3: Era Sylvia Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the Lightship Basket Museum? What is your position within the institution? What exactly does your position entail?
    - Era has been at the Lightship Basket Museum for a couple of years. She assists the executive director, Maryann Wasik.

2. Why is the Lightship Basket Museum interested in the idea of a shared collections facility?
    - The museum would benefit from having more proper storage space.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?
    - The majority of the collection is made up of baskets but there are also some documents and logbooks from ships.
2. Where are your collections currently stored?
    - At Nantucket Storage and at the office
3. How are your collections stored with regard to all the different objects?
    - Baskets are wrapped in tissue paper and bagged
4. How much floor space does each type of collection currently take up?
    - No more than 400 sqft
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a
6. What particular objects or kinds of objects are most difficult to store without damage?
    - n/a
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - n/a
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - Yes, Lightship Basket Museum expects high growth due to a substantial amount of lightship artifacts.
10. How often are they examined for damage?
    - Objects are examined for damage twice a year.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.
    - An area with climate control, particularly low moisture

12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - The collections are currently highly unorganized.
13. Do you have an existing inventory of your collections?
    a. Is this a paper and/or electronic inventory?
    - There is an electronic inventory as well as paper and accession reports.
    b. How is the inventory arranged (e.g., by object, type, etc.)?
    - n/a
    c. Is it maintained as a database?
    - Yes
    d. How is it kept up to date and by whom?
    - By using past perfect museum software and it is kept up to date by Era Sylvia.
    e. Would it be available for us to use for our study?
    - Yes

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - It would instill a sense of community camaraderie.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - A new facility would be better.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - Plenty of appropriate shelving and high safety and security
5. What are some of the concerns you have about developing such a facility?
    - Concerned about management and the future money and upkeep necessary for the facility.

Section 1.4: Cecil Jensen and Robert Frazier Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of

your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the Artists Association of Nantucket? What is your position within the institution? What exactly does your position entail?
    - Cecil Jensen has been at the Artists Association of Nantucket for three years. She is the executive director.
2. Why is the Artists Association of Nantucket interested in the idea of a shared collections facility?
    - There is a need for enough proper storage. It would also be beneficial to take part in a collaborative effort on the island.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?
    - There are a lot of paintings and some objects and paper.
2. Where are your collections currently stored?
    - The collections are stored at Nantucket Storage, the gallery, and some in the office.
3. How are your collections stored with regard to all the different objects?
    - The paintings are separated by cardboard.
4. How much floor space does each type of collection currently take up?
    - 768 square feet
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a
6. What particular objects or kinds of objects are most difficult to store without damage?
    - n/a
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - A fire in the 1970's burned some of the collection
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - Yes, the collections is expected to grow by about 15-25 pieces each year.
10. How often are they examined for damage?
    - They are examined for damage once a week.

11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.
    - n/a
12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - The collection is not insured due to a low budget and therefore should be in a bigger space with better protection.
13. Do you have an existing inventory of your collections?
    a. Is this a paper and/or electronic inventory?
    - There is an electronic inventory.
    b. How is the inventory arranged (e.g., by object, type, etc.)?
    - It is arranged by object
    c. Is it maintained as a database?
    - Yes
    d. How is it kept up to date and by whom?
    - It is kept up to date using museum software by Robert Frazier, curator of exhibitions.
    e. Would it be available for us to use for our study?
    - Yes

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - There would be more space and better security and protection for the collections.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - Renovating an existing building might be cheaper.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - Museum quality art storage
5. What are some of the concerns you have about developing such a facility?

- Main concerns are safety and security of the collections.

Section 1.5: Jean Grimmer and Lisa McCandless Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the Egan Maritime Institute? What is your position within the institution? What exactly does your position entail?
    - Jean Grimmer is the executive director and has been at the institution for eight years. Lisa McCandless is the assistant director, as well as a curator, and has been at the institute for two years.
2. Why is the Egan Maritime Institute interested in the idea of a shared collections facility?
    - The institute is currently using Nantucket Storage which is not the perfect climate, it is too cold and lacks humidity control and lights in the units. It is not the right place for serious collections of art.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?
    - Mostly paintings but there are also statues, scrimshaws, and boat models.
2. Where are your collections currently stored?
    - Collections are stored at Nantucket Storage and at the Nantucket Shipwreck and Lifesaving Museum.
3. How are your collections stored with regard to all the different objects?
    - At the Nantucket Shipwreck and Lifesaving Museum there is an archival room with shelves, cabinets, acid-free boxes and folders, and white gloves to safely store and handle material.
4. How much floor space does each type of collection currently take up?
    - The collection takes up 775 sqft.
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a

6. What particular objects or kinds of objects are most difficult to store without damage?
    - n/a
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - n/a
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - Yes, the collections I expected to grow by about 20 pieces per year.
10. How often are they examined for damage?
    - Collections are examined six times a year for damage.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.
    - Lisa shared a need for an area for paintings that need to be worked on.
12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - They are not in a proper environment and need better climate control as well as security and safety.
13. Do you have an existing inventory of your collections?
    a. Is this a paper and/or electronic inventory?
    - There is an electronic inventory.
    b. How is the inventory arranged (e.g., by object, type, etc.)?
    - The inventory is arranged by object.
    c. Is it maintained as a database?
    - Yes
    d. How is it kept up to date and by whom?
    - It is kept up using museum software by Lisa.
    e. Would it be available for us to use for our study?
    - Yes

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - This type of facility would be financially beneficial to the organizations and would also provide peace of mind due to the security and safety. It is a positive effort in collaboration and awareness of what each of the organization's collections contain.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - Building a new building would be best. Retrofitting an existing building may cause the cost to be disproportionate to the needs of the building.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - Many of the features found in the Gosnold Center owned by the Nantucket Historical Association, it is a good model.
5. What are some of the concerns you have about developing such a facility?
    - Primarily have financial concerns regarding the cost of this type of facility.

Section 1.6: Jim Lentowski Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the NCF? What is your position within the institution? What exactly does your position entail?
    a. Executive director for the Nantucket Conservation Foundation.
2. Why is the NCF interested in the idea of a shared collections facility?
    - Digitalization of records and extra storage.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?

- Plant files, mostly records, and some historic cranberry equiptment.

2. Where are your collections currently stored?
    - Here at the NCF.
3. How are your collections stored with regard to all the different objects?
    - Paper in cabinets and computers frequently backed up.
4. How much floor space does each type of collection currently take up?
    - 15 square feet of floor space.
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a
6. What particular objects or kinds of objects are most difficult to store without damage?
    - n/a
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - "No damage… yet."
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - "Paper always accumulates."
10. How often are they examined for damage?
    - Not specifically examined but viewed at random.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.
    - Acid free paper for plant flat files.
12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - Greatest concern is the digitalization of records to reduce space use.
13. Do you have an existing inventory of your collections?

- No inventory available.

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - Preservation of collections, records, and artifacts by institutions on the island.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - A new building would be better, can't be economically feasible to renovate.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - File cabinets and climate control for the facility.
5. What are some of the concerns you have about developing such a facility?
    - Money is a huge issue, would require a board of professionals to serve, not putting water pipes above the objects being stored.

Section 1.7: Andrew McKenna-Foster and Julia Blyth Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the MMA? What is your position within the institution? What exactly does your position entail?
    - Andrew – 8th summer as the director of natural science, in charge of research and education.
    - Julia – 2nd summer as collections manager, in charge of preparing specimen and displays.
2. Why is the MMA interested in the idea of a shared collections facility?
    - Sufficient space and proper conditions for storing the collections.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?
    - Birds, bones, plants, fish, fossils, old microscopes
2. Where are your collections currently stored?
    - They are stored in the basement of the Hinchman House and on display.
3. How are your collections stored with regard to all the different objects?
    - Sealed cabinets, jars in cabinets, drawers, and shelving
4. How much floor space does each type of collection currently take up?
    - A hard copy of this information was provided at interview.
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - Plants in flat files.
6. What particular objects or kinds of objects are most difficult to store without damage?
    - Large bones and old mounted birds.
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - Some mold issues from humidity. 15 years ago had some insect damage among collections.
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - Expect to grow approximately 0.5% each year.
10. How often are they examined for damage?
    - Since parts of the collection are being worked with some gets checked more frequently than others.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.
    - Pest control

12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - Space, and safe clean storage.
13. Do you have an existing inventory of your collections?
    - Have an electronic inventory but does not contain the insects.

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - Controlled humidity, clean building, cost sharing, easier to keep watch over.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - A new building. No suitable existing site.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - A work space, microscope areas, compressor shelves, a hood for fumes, and a flammable storage area somewhere on site.
5. What are some of the concerns you have about developing such a facility?
    - Accessibility, use of collections, and the safe transportation of the specimen.

Section 1.8: Renee Oliver and Bill Oliver Interview

We are students from Worcester Polytechnic Institute, currently working on an interdisciplinary research project which is one of our degree requirements. The goal of our project is to determine the feasibility of a shared collections facility on Nantucket. We're going to ask you a few questions while noting some of your answers. Would it be ok if we were to quote some of your responses in our paper? If we were to use something you say, you would have the right to review any quotations in advance.

1. How long have you been at the AMH? What is your position within the institution? What exactly does your position entail?
    - The co-site managers of the African Meeting House.
2. Why is the AMH interested in the idea of a shared collections facility?
    - The artifacts are not being looked after or cared for properly currently.

Now we would like to ask you some specific questions about your collection.

1. What types of objects are in your collections?
    - Historic artifacts, books, furniture, among historic buildings.
2. Where are your collections currently stored?
    - They are stored at Nantucket Storage, the Boston Higginbotham House basement, as well as in various historic buildings on the island.
3. How are your collections stored with regard to all the different objects?
    - n/a
4. How much floor space does each type of collection currently take up?
    - In depth calculations to be made then we will receive that value.
5. What particular objects or kinds of objects in your collection are the easiest to store without damage?
    - n/a
6. What particular objects or kinds of objects are most difficult to store without damage?
    - n/a
7. Do you have any objects that have suffered substantive damage during storage? What kinds of damage? How did the damage occur? What could be done to avoid the damage?
    - About 1600 books were at one point covered in mold, have been cleaned since.
8. Do you have sufficient storage space currently for your collections?
    - No
9. Do you expect your collection to grow in the future? Can you predict how rapidly it will grow?
    - There is expectation of some growth, however no accurate prediction could be made.
10. How often are they examined for damage?
    - The objects are checked for damage at random, mostly when going to retrieve or replace an object from storage.
11. Do you know of any specific needs for anything in your collections? For example, the MMA organization has expressed a specific need for pest control for their insect collection. They are currently using moth balls but would prefer a more environmentally-friendly method for pest control.

- n/a

12. What are your greatest concerns about the current state of your collections and what are your greatest needs for collections storage?
    - Greatest concern is the current state of the storage in which the collections are currently in.
13. Do you have an existing inventory of your collections?
    - No updated inventory was available.

As you know, several institutions on the island have expressed an interest in developing a joint collections facility; we would now like to ask you some questions about that option.

1. What do you think might be the advantages of a shared collections facility?
    - Saving money and preservation of artifacts.
2. Do you think it would be better to build a new facility or renovate an existing building? Why/why not?
    - A new building would probably be more likely for this project.
3. Do you know of any existing building that could be renovated for such uses?
    - No
4. What kinds of features would you want to see in such a facility?
    - Would prefer that people could go in and view the exhibits rather than it solely being a storage facility. Want people to touch and learn from collection.
5. What are some of the concerns you have about developing such a facility?
    - Biggest concern is that the collections are not going to be accessible to the public and therefore loses the intent for which it is being preserved.

Appendix II: Photographs from 'Walkthrough' Site Visits


Perma 100


Mason & Hamlin

Appendix III: Summary of Conference Call with William Dunlap

New Hampshire Historical Society: Executive Director William Dunlap

- Concluded a study on a collaborative venture between statewide and regional New Hampshire collecting institutions about a year and a half ago
    - Decided to perform this study in order to save on cost and provide an opportunity to see what objects are in everyone's collections through a joint catalogue
- There were 8 partners including:
    - New Hampshire Historical Society
    - Currier Museum of Art
    - Strawbery Banke
    - Canterbury Shaker Village
    - Historical Society of Cheshire County
    - Manchester Historic Association
    - Nashua Historical Society
    - Peterborough Historical Society
- Collections included a variety of artifacts such as museum objects, photos, manuscripts, and books.
- They received a foundation grant to conduct this study. The study was conducted by Technical Development Corp (TDC), a nonprofit management consulting and research group from Boston, MA
- Issues they ran into:
    - Cataloguing Software- Had to decide which software to use in order to create a joint catalogue for institutions with varying collections
    - Committee Collections- Had to determine how to comingle collections while keeping strict intellectual control and clear division between what objects belonged to which institutions
    - Physical Requirements- There was a large volume (60-70 sq ft) and great need for environmental control which then led to a high facility cost
    - Finances
        - Facility had a high cost
        - Determining which model would be more efficient: creating an entity with shares for each partner or having one senior partner with junior partners renting space from them
        - Raising money jointly is challenging
        - Determine what action to take if any partner was to run into a financial struggle
    - Open Storage- Wanted to store everything in an open way so that the public can access and view objects but it increased the cost and raised personnel issues
- This study determined the facility not to be feasible due to a high cost
    - The facility was estimated to cost $20 million

    - Utilities and maintenance were estimated to require a $10 million endowment, 5% would be used per year to operate the facility
    - The partners involved were small with low budgets

- This study taught the participating institutions many options that could potentially be looked into
    - In hindsight, cost would've been lower if they had chosen to retrofit an existing building. Found an option later that would've reduced the cost to about $4 million
    - The idealistic approach was too costly, there could've been a more economical model
    - William Dunlap believes that it could come back to life using what was learned through the study
- Staff would've worked office hours then extensive security system would be main source of protection
- There would have been agreed upon protocols and standards, including for the state in which objects would be brought into the facility
- Cost would have been rated on the storage needs of each institution
- Some suggestions in regards to the Nantucket project:
    - Determine critical mass, is there a point at which below the storage facility is no longer feasible
    - Determine how much each institution will be able to save through the use of this facility and if they can contribute the savings to the cost of the facility
    - Determine the financial strength of those involved to deter negative financial ramifications
    - Put in a little extra space for growth, but balance that against the increased cost of a lot of extra space
    - Appeal to native Nantucketers during fund raising